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SUCCESS FACTORS OF SELECTIVE INFORMATION TECHNOLOGY OUTSOURCING IN ENTERPRISE RESOURCE PLANNING PROJECTS IN ISRAEL

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Acknowledgments

I would like to dedicate my thesis to the memory of my dear parents Yaakov and Haviva-Hilda Itzhaik, who raised me and inspired me to pursue excellence and self-fulfilment. I know that they follow and bless my endeavours from above.

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Yehoshua Itzhaik

I dedicate my work to the memory of my dear parents

Yaakov and Haviva-Hilda Itzhaik

and my dear father in law Yaakov Goldman

who inspired me to pursue excellence and self-fulfillment

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ABSTRACT

FACULTY OF HEALTH, SOCIAL CARE & EDUCATION

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SUCCESS FACTORS OF SELECTIVE INFORMATION TECHNOLOGY OUTSOURCING IN ENTERPRISE RESOURCE PLANNING PROJECTS IN ISRAEL

by YEHOSHUA ITZHAIK

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IT Outsourcing (contracting-out of Information Technology services) has become a pivotal economic trend in recent decades. This study traces the interlacing of IT Outsourcing with Enterprise Resource Planning (ERP) software systems. Little research has considered the reciprocal relations between these two phenomena. This was the gap in knowledge addressed by the research. More specifically, the research investigated: why organisations turn to IT Outsourcing providers to implement and maintain ERP systems and what are the success factors for selective IT Outsourcing within ERP projects in Israel.

Field research was conducted in organisations during 2006-2008, employing IT Outsourcing for ERP systems in two stages: **Stage One** used qualitative data-collection tools: five semi-structured interviews and fifteen open-ended questionnaires. Inductive content and thematic analysis conducted on data from these tools produced themes that formed the basis for a closed-ended questionnaire used in the next stage. **Stage Two** employed seventy two closed-ended questionnaires. Quantitative data from this questionnaire underwent deductive statistical analysis to test and confirm findings from Stage One.

Results indicated that significant differences between ERP package-based centralised cross-organisational systems and the out-dated self-developed legacy IT systems produced different organisational requirements for IT Outsourcing services. Respondents thought it essential to employ IT Outsourcing for ERP projects, noting different motivations for this strategy. Respondents identified four success factor groups for IT Outsourcing in ERP projects, grading the factors according to relative importance. Management commitment and support was the most important success factor group.

The research showed that organisations that implement ERP systems regard it as essential to employ the IT Outsourcing services since they provide experienced updated experts. Organisations stress that they need these services to ensure effective, operable systems, understanding that initially there is little cost reduction. Management commitment, wise choice of vendors and intelligent contracting can establish successful vendor-organisation collaboration. Contribution to knowledge is made by offering a better understanding of the unique phenomenon of IT Outsourcing within ERP projects in Israel, motivations to use and success factors

Key words: Information Technology (IT), Outsourcing, Enterprise Resource Planning (ERP), Success factors.

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Prologue

The issue of IT Outsourcing in ERP projects has occupied most of my business life. For me the present study offered a splendid opportunity to put my gut feelings and observations into a more scientific order, and to acquire and practice new analytical skills according to PhD. thesis standards.

I am a software engineer and Information Technology (IT) expert and have made my living as an ERP (Enterprise Resource Planning) consultant to the largest organisations in Israel. Since my graduation from the Technion, the highly prestigious Israeli technological institute, I have witnessed the evolvement of enterprise software from an operational discipline into a strategic platform that plays a crucial role in the organisation's life. As a subcontractor providing outsourcing services, I have been always an outsider in the outsourced organisation, whether as a developer in the client's team, or later on, when I had my own company, and I have gained considerable experience in negotiating and closing outsourcing contracts.

The research helped me to understand the motivations of the outsourced organisations from their own point of view, their difficulties and the way they attempt to cope with them.

For the last three decades of the IT revolution**,** I saw the growth of corporate needs and how software houses have faced these challenges. I witnessed periods when hardware predominated; dinosaurs such as IBM (in its early days), DIGITAL, Data General and others were market leaders.

The mainframes were first with their strong central development departments, and these were followed by distributed working stations and PCs distributed throughout organisations with many, on-shelf tools and products. In this period, many software houses developed tailor-made solutions. Outsourcing was employed in large-scale government and corporate projects and was performed by the IT service companies.

Since the beginning of the last decade, hardware and software have evolved into "solutions", and "information" replaces "data", with generic ERP platforms, CRM (Customer Relation Management), and strategic tools that have evolved for management, providing a comprehensive range of an organisation's operational software and hardware platforms. In parallel, we are exposed to the immense Internet

revolution and also user experience and WEB services using the World Wide Web (www) infrastructure. Today we are in the throes of an exciting communication revolution, when all resources converge to provide mobile, high-quality information at any place and any time, and IT has become a most significant and innovative factor in any organisation's reality.

High level professionalism and expertise are now the name of the game, and IT Outsourcing is one of the main tools to get it. IT influences the development and the performance of all aspects of the business, and decision-making processes are based on updated and meaningful data. These services can give the company its real competitive edge, protect it from strategic risks and enable it to respond quickly to day-to-day hazards. All these crucial missions need highly qualified expertise and strong management involvement, both at the business and professional levels with expertise that in most cases cannot be found within the organisation's core technology and activities, leaving a wide role for third party companies that can specialize and focus on narrow, segmented categories that need special or multiple skills. Outsourcing providers undertake this challenge and have become a corner-stone for the life of most organisations.

IT Outsourcing's significant role has led to the development of new methodologies: processes and their outputs have been measured and evaluated and appropriate conceptual theories are being suggested to explain and reach conclusions concerning best practice.

Organisations' IT managers are challenged to achieve high quality products and services, better performance and better response time for the increasing needs of the organisation, creating ever stronger tools for business performance to reduce costs and protect the organisation against competition. The IT Outsourcing solution has therefore become a fast growing business with national and international implications. This development has been made possible through technological advantages such as the Internet and mobile services, lower communication costs and higher specialisation in service provision.

Since the very beginning of my professional life and throughout the past two decades, I have been a modest player in the outsourcing marketplace, contracting out and supplying IT services. While managing business and professional aspects with clients and co-workers, I have gained wide experience as programmer, system analyst and team and project leader of complicated software projects, witnessing the evolvement of the IT systems from isolated islands to cross-organisational (ERP, CRM) networks and the boosting effect this trend has had on Outsourcing, the vendors and the enterprise itself. This was the professional experience that I brought to the research.

The research offered an opportunity to gather new knowledge from the relevant literature to conceptualise what had been my gut feelings during these years of work. It also enabled me to understand the meaning of my intervention as an outsourcer in the various organisations and to theorise which elements would ensure the success of such intervention.

I hope that the outcomes of my research will serve my colleagues in other countries, and add to existing knowledge of this important aspect in IT and business industries in Israel.

Section 1: Introduction

Preview

The first section of my thesis describes the context and the background of the research. Chapter 1 presents the subject of the research and its importance, relating first to the Information Technology (IT)[1] field, the Enterprise Resources Planning (ERP) phenomenon as one category of IT, the IT Outsourcing phenomenon and its relation to ERP projects. Chapter 1 will also serve as an introduction to the base concepts of the research.

[1] Throughout the thesis I have chosen to use the term 'Information Technology' as the accurate title to describe the field of knowledge to which the research relates. The term Information systems (IS) has been around a lot longer than the computer, or the term Information Technology and is a large umbrella term referring to systems designed to create, store, manipulate, or disseminate information. Information Technology (IT) that falls under the IS term deals with the technology involved in the systems. In many earlier studies, IS was the term commonly used.

Chapter 1 - The context of IT Outsourcing within ERP projects

This chapter describes the phenomenon of IT Outsourcing within ERP projects in Israel and other countries; it explains the context of the research within Israeli IT service systems and the contribution that the research may provide to knowledge in this field.

1.1 Background to the Research

For many years I have been involved as a hands-on practitioner in the IT fields, especially in cross-organisation computer systems such as ERP as a consultant and outsourcing services provider. The emerging phenomenon of IT Outsourcing constitutes an integral part of these fields and I was motivated to investigate its implications in ERP projects in Israel.

My initial intention was to apply existing research results concerning this issue from international literature to the Israeli context, but I then discovered that although both these phenomena, ERP and IT Outsourcing, have been investigated intensively and separately in the literature, only limited research literature exists that has tried to understand the mutual inter-relations between IT Outsourcing and ERP (for example, Dibbern, Brehm and Heinzl, 2002; Wu, Ding and Hitt 2004). This lack of information indicated that there was a substantial gap in knowledge regarding the dynamics of IT Outsourcing within ERP projects.

1.2 IT, ERP and IT Outsourcing

According to Frenzel and Frenzel (2004), IT refers to an organisation's entire computing and communication infrastructure, including multimedia software and hardware, on-shelf products in use and customised software applications. Van der Zee (2002) maintained that IT is one of the crucial driving forces for survival and growth in competitive markets and it becomes a strategic tool that management can employ to increase flexibility and take advantage of new opportunities. Jalava and Pohjola (2002) suggested that the benefits generated by IT include improvement of product development cycle time, customer convenience, quality control, production and distribution of knowledge, increased industrial efficiency, and a faster response to business opportunities. Based on previous studies performed in the USA, Atkinson

and McKay (2007) argued that IT impacts the economy in five main areas: 1) productivity; 2) employment; 3) market efficiency; 4) higher quality goods and services; and 5) innovation of new products and services. These studies show that organisations with the highest levels of IT investment per worker also had the highest levels of productivity and benefits.

ERP is one of the dominant emerging categories of IT systems, being package-based and constituting a cross-organisational system (Seddon, Shanks and Willcocks, 2003). As pointed out by Hedman and Borell (2004), ERP now replaces many of the traditional organisational IT systems. ERP was defined by Klaus, Rosemann and Gable, (2000), as a strategic business solution that integrates all the business functions of the organisation. The system is composed of many different modules that connect to the organisation's financial and other data-collecting systems. It enables the integration of the organisation's transaction-oriented data and business processes. ERP plays a central role in the organisation's management as it establishes one database, one application, and a unified interface across the entire organisation (Currie and Selsikas, 2001). Zheng and Tarn (2000) warned that these systems affect so many aspects of an organisation's internal and external operations that their successful deployment and use become critical to organisational performance and survival.

In traditional organisations, the internal IT department is responsible for delivering IT services throughout the entire organisation, sometimes using external resources. Outsourcing is a phrase used to describe the practice of seeking resources - or subcontracting specific tasks - outside of an organisational structure for all or part of an IT function, as explained by Amberg, Fischl and Wiener (2005):

> *... the word 'outsourcing' finds its roots in the words 'outside', 'resource' and 'using'. Generally speaking, it reflects the use of external agents to perform one or more organisational activities (e. g. purchasing of a service) and is therefore not solely specific ...* [to IT]. *In addition, Schwarz (2005) argues that the aspect of in-house performance of a specific activity prior to outsourcing that same activity must also be considered, as some start-up companies speak of 'outsourcing' functions which they have never performed themselves* (p.2).

Lacity and Hirschheim (1993b) referred to the IT Outsourcing phenomenon as the organisational arrangement established for obtaining IT services and the management of resources and activities from external organisations which specialise in these functions.

IT Outsourcing is often presented as an attractive business performance tool to improve productivity, reduce costs and increase competitiveness (Tettelbach, 2000; Lacity and Willcocks, 2001). Alborz, Seddon and Scheepers (2003) and Cullen and Willcocks (2003) claimed that outsourcing also increases access to updated technologies and skilled personnel. This was supported by Hirschheim, Rudy and Lacity (2000) who argued that gaining access to specific IT skills and services can enhance organisations' IT competence, enabling them to refocus on their core business, and reduces costs and time resources.

IT Outsourcing emerges as a wide and most important worldwide phenomenon and is used increasingly as a strategic, organisation-wide initiative, much more than just an operational IT issue (Dibbern, Goles, Hirschheim and Jayatilaka, 2004). Attempting to understand the popularity of outsourcing, Amberg and Wiener (2006) suggested that the benefits of IT Outsourcing could be classified into three categories: financial, qualitative, and strategic. Financial benefits include reduction of IT costs, improved cost transparency, conversion of fixed costs, and reduced capital lockup, while qualitative benefits consist of improved service quality, improvement of business processes, guaranteed service levels, and access to technical knowhow, and strategic benefits include improved flexibility, a focus on core competencies, restructuring of the corporate organisation, insight concerning innovative technologies, transfer of risks, and reduction of the time-to-market.

Many organisations are today under pressure to meet the challenges of increasing competition, and they need to be better, cheaper, and faster than competitors. Sparrow (2003) indicated that managers believe that IT Outsourcing activities can beneficially impact on the organisation's need for efficiency and effectiveness. Min Tjoa et al. (2006, p.342) claimed that: "*in addition they* [outsourcing activities] *also provide the capability to improve core business practices such as human resources, manufacturing, marketing and finance*".

Similar opinions had been voiced earlier by ERP researchers such as Hong and Kim (2002), Mandal and Gunasekaran (2002), Al-Mashari, Al-Mudimigh and Zairi (2003) and Yusuf, Gunasekaran and Abthorpe (2004), all of whom concluded that ERP systems are the right solution for these needs.

As a result of the shift toward ERP and other cross-organisational systems, traditional IT systems or departments now relate in a changed manner to several critical subjects. One such subject clearly indicated by the above-mentioned sources is the increased need for external expertise, generating questions concerning the necessity for IT Outsourcing. Since very limited literature relates to the correlation between these two phenomena (ERP and IT Outsourcing), it is therefore hoped that this research can help to bridge this gap and make a modest contribution to knowledge in this field.

The International ERP market is enormous and amounted to $50 billion in 2008, when according to the AMR research report, SAP and Oracle (the leading ERP Package providers) dominated the market with a share of 31% and 17% respectively (D'Aquila et al. 2009). Implementation of an ERP system is usually a large and significant investment costing up to $400,000 for an organisation with less than $50 million in revenue, and up to $6 million in total ERP costs for an organisation with over $500 million in revenues (Aberdeen Group survey, 2007). Implementation costs might be five times the cost of the basic software ERP package or even more, so the total spending might approximate $250 billion in 2008, indicating huge investments in ERP (D'Aquila et al. 2009). According to Davenport (2000a) a fast implementation can take as few as six months; a slow one can take up to five years or more. Often, the implementation process diverts valuable resources, which might be needed to run the organisation's everyday business.

1.3 The context of the research in Israel

According to the IDC market research report on the Israeli IT Services Market, "*2010-2014 Forecast and 2009 Vendor Shares*" (IDC, 2011) published in August 2010, 45% of Israel's medium/big companies were then using IT Outsourcing, and 24% of the IT professionals in an average organisation were derived from an external force. So, IT Outsourcing plays a significant role in the Israeli IT market. The IDC

study indicates that the scope of the software market as a whole - which includes mainly cross-organisational systems such as ERP systems, customer relationship management (CRM), business intelligence tools (BI), databases, development tools, mail systems and other systems - stood, in 2009, at about $940 million. According to the report, the demand for IT Outsourcing and business processes, as well as extensive regulatory changes and reforms in the financial sector, were then the main factors affecting the IT services market in Israel.

The leading vendors of IT services in Israel are: IBM Global Services, Ness Technologies, Matrix, Hewlett Packard Israel, the Taldor Group, Malam-Team Group, and the Yael Group. The top five companies accounted for 46.5% of the market in 2009 and were involved in large scale projects in the governmental and public sector, and also provide services for financial and industrial corporations in Israel. The IDC report on the Israel IT Services Market "*2011-2015 Forecast and 2010 Vendor Shares"*(IDC, 2011) estimated that the IT services segment was worth $1.9bn in 2011 and this was expected to grow at a compound annual growth rate of 8% to reach $2.4bn in 2015.

The STKI market research's ranking of Israeli computer companies indicated that in 2011 the two companies Malam-Team and Matrix headed the list, each holding approximately 12% of the computer services market in Israel, followed by Ness, Teldor and One1. STKI also noted that the computer industry had grown during 2010 by 20% reaching a worth of 4.87 billion dollars (Hirschauge, 2011).

1.4 The research delimitation

This then is the topic of my research: the investigation of particular questions relating to the application and operation of IT Outsourcing within ERP systems in Israel. Other important issues relating to IT Outsourcing remain beyond the scope of this research: the growth of several new areas of IT Outsourcing such as WEB and e-Business and the Application Services Provider (ASP) industry in which the ASPs buy, install, and manage enterprise applications at remote data centres, hosting them for customers via a broadband connection, usually over the Internet (Dibbern et al., 2004).

Another growth area not considered relevant to this research is offshore outsourcing or 'offshoring' where an organisation outsources its IT activities to one or more vendors located outside their country, typically India. Companies look to offshoring largely for cost considerations, as the differences in cost between the 'first' and 'developing' worlds are dramatic. According to Hayes and McDougall, (2003), reports from the US suggest that international outsourcing can reduce costs anywhere between 30% and 70%. Athreye (2005a, 2005b) documents important information about the Indian software industry and its competitive advantage in IT. The Indian Government has gained from years of investment in IT education and from indulgent policies toward the IT industry. Also, the fact that English is widely spoken in India is a great advantage that eases international personal communication. Hayes and McDougal (2003) suggest that these factors plus an early adoption of international software quality standards ensure that India will continue to provide increasing outsourcing services for years to come.

According to Phillips (2002), China shares many of India's advantages in the outsourcing market such as cheap labour costs and favourable government policies. Other major countries involved in offshore development include Philippines, Mexico, Ireland, Israel, Malaysia, and Singapore (NASSCOM-Kinsey, 2002), with Vietnam (Tran, 2002), Russia (Chazam, 2001), and Canada (Gallagher, 2002) eager to seriously enter the market. These foreign countries provide IT services for US-based companies, putting overseas outsourcing at the centre of one of the most controversial topics of debate stirring up the Hi-tech world.

However, Willcocks and Lacity (1998) noted that Offshore IT Outsourcing involves costly coordination outputs, particularly over long distances and therefore sets challenges concerning the economic and political problems involved in jobs' transitions. Sridhar (2004) argued that the strong growth in Offshoring has meant that IT Outsourcing has transitioned from being a rather unremarkable business tactic to a politically hot issue, causing strong feelings in the US and the UK on the relative merits of this practice. Local employees often feel that their jobs are at risk because of outsourced projects. Jealousy, competition and bitterness are only some of the emotional barriers that may obstruct the needed harmony between client and vendor of these services. Thus, offshore outsourcing is considered to be outside the boundaries of my research which will focus on IT Outsourcing within Israel.

The identified gap in knowledge relating to the lack of research and theory on the relationship between IT Outsourcing and ERP covers many specific topics, but in particular there have been no attempts to find the reasons for IT Outsourcing in ERP projects; investigating whether these reasons differ from those that motivate the use of outsourcing in traditional software projects, and if so, in what ways; and which factors are likely to influence successful outcomes of IT Outsourcing employed in ERP projects in Israel. These issues were unanswered in the existing literature and formed the basis for the investigative work of this study.

1.5 Summary

This chapter introduced the global and local Israeli context of the research. The next section explores what is already known about the studied subject, reviewing and discussing extant literature that relates to IT Outsourcing, its sources, benefits and risks. As the extent and limitations of extant knowledge emerged from this review, unanswered questions began to take shape more clearly. These provided the basis for the formation of the formal research questions which were explored in this study.

Section 2: Theoretical Perspectives

Preview

The second section of my thesis reviews the relevant literature relating to various theoretical perspectives concerning the studied topic. Cooper (1988) suggests:

> *… a literature review uses as its database reports of primary or original scholarship, and does not report new primary scholarship itself … Second a literature review seeks to describe, summarize, evaluate, clarify and/or integrate the content of primary reports* (p. 104).

Thus, the following literature review aims to summarise and synthesise the arguments and ideas of others in the relevant research area, and to convey to the readers the knowledge and ideas that have been established on the subject area of this research, their strengths and weaknesses.

Chapter 2: IT Outsourcing, Reasons, Benefits and Risks

Outsourcing is one of the most widely used strategies for organisations who wish to respond to and succeed in today's fast changing market conditions, which are characterised by globalisation, fast information spread, intensive technological development and innovation. It has now become a commonly accepted business practice. This chapter discusses possible motivations for the employment of IT Outsourcing and indicates the risks involved in its use as they emerge from current literature.

2.1 IT Outsourcing: definitions

IT Outsourcing applies the concept of hiring outside professional services to meet an organisation's in-house needs (Gupta and Gupta, 1992). Cheon, Grover and Teng (1995, p. 209) define IT Outsourcing as "*the organisational decision to turn over part or all of an organisation's IT functions to external services provider(s) in order for an organisation to be able to achieve its goals"*. Kern and Willcocks (2002), refer to IT Outsourcing as a process undertaken by an organisation to contract-out various functions.

A wide range of services is available from IT Outsourcing vendors. These services include network services, data centre services, desktop, call centres, web hosting, and applications development and maintenance. The definition adopted in Section 1 above sees 'outsourcing' as: the organisational arrangement instituted for obtaining IT services and the management of resources and activities required to produce these services (Lacity and Hirschheim, 1993b). The term 'IT services' refers to the manner in which IT products are delivered and the provision of IT functions. An 'organisational arrangement' refers to the formal structure of the responsibility and delegation of responsibility for tasks within the IT function (Lacity and Hirschheim, 1993b).

According to Gonzalez et al. (2006), the IT Outsourcing phenomenon has become one of the strategies pursued by organisations for different tactical and strategic reasons in recent years. The scope of IT Outsourcing frequently involves a much greater range and depth of services than it did in the past, with an increasing number of IT functions being transferred to IT service providers (Lee and Kim, 2003).

Many organisations look toward IT Outsourcing as a standard management tool to help them to achieve their objectives. King and Torkzadeh (2008, p. 205) claimed that IT Outsourcing has been one of the most discussed phenomena of the recent years.

Research concerning IT Outsourcing has traditionally addressed three major questions (Why-What-How): (1) why should an organisation employ outsourcing? (2) What should be outsourced? and (3) How should outsourcing be conducted? Studies that relate to these questions are now considered in more detail.

2.2 Motivations for Outsourcing

Venkatraman (1997) claimed that the outsourcing debate had moved from whether to outsource, to what and how to outsource. Yang and Huang (2000) suggested that the most important consideration when organisations think about outsourcing is to assess benefits that they could obtain. They categorised three main types of potential benefits: economic, technological and strategic,

Various motivations have been suggested both for and against the use of IT Outsourcing. Costa (2001) identified three driving forces for IT Outsourcing in parallel to the three types of benefits noted above: cost reduction (economic), technical consideration (technological) and the need to focus on core competencies of the business (strategic).

Susarla, Barua and Whinston (2003) asserted that the most important reason in favour of outsourcing is cost reduction. Bahli and Rivard (2005) indicated that sometimes the reduced cost factor is used by management as a default justification for the IT Outsourcing decision. Bergkvist and Johansson (2007) suggested that the motivation for IT Outsourcing is often a result of a mix of the three main factors enumerated by Costa (2001), cost reduction, access to technological expertise and focus on core competence. These three factors are now considered in greater detail

2.2.1 Cost Reduction

A comprehensive study by Collins and Millen (1995) carried out in the United States, found that cost savings resulting from a reduction of personnel were the main reason for IT Outsourcing. Aalders (2002) notes that cost reduction is the most

frequently cited factor in IT Outsourcing literature. In this context, cost reduction means the reduction of direct expenses on IT projects and Aalders (2002) indicated that many organisations world-wide outsourced part or all of their IT functions in order to reduce manpower, supplies and maintenance costs. Lacity and Willcocks (2001) also reported low-cost as a customers' motivation for the organisation's willingness to outsource. Papp (2003) argued that cost reduction is a major factor in the decision to outsource and may give the organisation a competitive advantage.

Although Dibbern et al. (2004) suggested that IT vendors possess economies of scale (the cost advantages that an enterprise obtains due to expansion) and technical expertise in comparison to IT internal departments and therefore can provide IT services more efficiently, Harland et al. (2005) warned that there is a potential risk of cost increases due to outsourcing. Bergkvist and Johansson (2007) pointed up that the cost perspective actually includes two motivational factors, the cost savings itself and the ability to obtain more predictable IT costs. Contrastingly, Yang, Seongcheol, Nam and Min (2007) rejected the claims that low costs are a main reason for outsourcing. They agreed that the cost aspect of IT Outsourcing was particularly important in the past. However, in recent years, they identified a shift from cost-related reasons to more sophisticated and soft reasons, while the cost aspect is now only partially relevant and no longer crucial.

2.2.2 Technical Skills and Qualified Resources

In contradiction to the above claim that the tactical decision to reduce costs is the main driving motivation for IT Outsourcing, Teng, Cheon and Grover (1995) and Yang and Huang (2000), suggest that the main reason for IT Outsourcing is to obtain IT skills and expertise which are not available internally and thus to gain a competitive market advantage.

A survey, conducted in Australia by Cullen, Willcocks and Seddon (2001) found that 60% of the participants cited "access to skills / expertise" as the main motivation for outsourcing. Zhu, Hsu and Lillie (2001) mentioned that hiring and retaining highly trained technology professionals and gaining access to external expertise are important reasons for IT Outsourcing. However, Jennings (2002) considered that outsourcing could potentially lead to loss of IT skills and knowledge that the organisation would do better to keep in-house.

Similarly Claver, Gonzalez, Gasco and Llopis (2002) envisaged several problems and risks involved in the use of outsourcing such as greater dependence on the provider and loss of critical skills and competencies, but also noted the advantage of increasing the flexibility of the IT department workforce and resources. Thus too, Edguer and Pervan (2004) noted the difficulty involved in making the decision to outsource, indicating that when organisations suffer from a shortage of skilled IT professionals, IT managers often select an outsourcing strategy in order to deliver faster, cheaper and better solutions, although they are aware that they might lose the chance to grow-up internal skills.

2.2.3 Focus on core competencies of the business

According to Core Competencies Theory, core activities of the organisation could be performed either in-house or by outsider vendors (outsourcing), while activities which are not core competencies should always be considered for outsourcing(Quinn, 1999). Caldwell and McGee (1997) supported this concept, claiming that outsourcing vendors generally promise to manage the functions that support the organisation's main activities, freeing up management time to focus on central strategic business issues. Thus, many organisations tend to separate support functions from the core activities of their businesses, outsourcing supportive tasks to a highly specialised third party vendor. IT activities can be developed in a much faster and more efficient way by the IT service provider for several reasons. First, the IT service provider may be able to retain very skilled personnel that would be too expensive for the organisation to employ full time. Second, the service provider has usually amassed a portfolio of development projects with alternative technical solutions. Third, the IT service provider retains extensive IT resources and capabilities (Clark, Zmud and McCray, 1998). Yang and Huang (2000) maintained that since the vendor provides the organisation with up-to-date external expertise, the organisation improves its capability to remain competitive. In this context, Quinn, Julien and Negrin (2000) mentioned the implicit 'value added' produced by outsourcing.

Beaumont and Sohal (2004) also suggested that managers should apply their experience and knowledge to core competencies and outsource activities in which they are less competent where they can benefit from vendors' expertise. Dibbern et

al. (2004) encouraged this strategy as it concentrates on what an organisation does best while outsourcing the rest. In the same manner and more specifically, Gonzales, Gasco and Llopez (2005a), argued that the organisation's management motivation is improved by IT Outsourcing since it facilitates a focus on more strategic issues and emphasises the importance of core competencies. Ozcelik and Altinkemer (2009) concluded that organisational performance improves as a result of IT Outsourcing.

2.2.4 Other motivations for outsourcing

A wider perspective of motivations involving transferring risks to the vendor was, suggested by Lacity, Willcocks and Feeny (1996) when using IT Outsourcing, organisations hope to leverage the vendor's resources and transfer any risks of non-performance of the IT function to the vendor. Some organisations even engage in multi-vendor outsourcing arrangements to further mitigate any remaining risks. Thus, they consider the reduction and diffusion of risk as another important reason for the organisations to use outsourcing.

Bailey et al. (2002) brought attention to the issue of service quality. Relying on the work of Clark, Zmud and McCray (1995) they claimed that increasing the quality of the service is the most important reason for outsourcing. Clark et al. (ibid) explained that the outsource service provider may have access to a more current technological environment, have more qualified or more motivated staff, provide a variety of IT services, have a better management system of co-ordination and control, and be more committed than the internal staff to make the alliance with the client organisation work effectively. Lacity and Willcocks (2001) supported this view indicating that customers look for well-supported IT products and services to enable them to achieve business objectives. Correspondingly, Kakabadse and Kakabadse (2002) pointed out several advantages in favour of the IT Outsourcing process. They contended that improving service quality is a highly ranked reason together with the benefit of being able to focus on core competencies, lower cost and better discipline and control, access to new technology and skills, reducing staff headcount, reducing capital costs, growth of in-house expertise (learning from outsiders), reducing transaction costs, improving technology to better utilise and leverage it throughout the organisation's processes and systems, enhancing the organisation's position in the

value chain, and enhancing the organisation's capability for change, all applicable for outsourcing in general.

Weele (2005) concurred with this view and offered additional reasons to explain why organisations would outsource, such as: achieving strategic goals, improving customer satisfaction and improving efficiency and effectiveness. On the other hand, Kakumanu and Portanova (2006) were concerned about a potentially negative impact of outsourcing as they note the quality of personnel and work cannot always be guaranteed.

Earl and Sampler (1998) argued that not all organisations benefit from the outsourcing deal, and that certain disadvantages of outsourcing (such as loss of managerial control , hidden costs, threat to security and confidentiality, quality problems and failure to implement new technology innovations) can create serious problems for organisations if it is not understood and managed properly. Claver et al. (2002) indicated that it is sometimes necessary to cope with situations where the provider does not comply with the contract, the qualification of provider's staff is unsatisfactory, and/or costs/benefits are unclear. Additionally there may be opposition from the organisation's internal IT staff, hidden costs in the contract, security issues, irreversibility of the outsourcing decision, and incapacity to adapt to new technologies.

Although many of the reasons and the expected benefits discussed above are common to most organisations, Dibbern et al. (2004) argue that the outsourcing decision is highly dependent on the specific situation and context of each organisation; and a unique mix of the general factors is involved in any such decision. In their review of previous literature on IT Outsourcing, Dibbern et al. (ibid) found that this situational approach was adopted by numerous empirical and conceptual works.

Table 2.1 below summarises several of the most frequently cited motivations for and advantages of outsourcing, some of which were mentioned in the above discussion. The list is compiled from the following sources Gilley and Rasheed (2000), Kakabadse and Kakabadse (2002), Jennings (2002), Quélin and Duhamel (2003), Gonzales, Gasco and Llopez (2005b), Bergkvist and Johansson (2007), Ozcelik and Altinkemer (2009).

Table 2.1: Summary of frequently cited motivations for and benefits of outsourcing

No.	Motivation for / Benefit of IT Outsourcing
1	Reduce IT costs and freeing-up cash flow by reducing in-house staff
2	Reduce overheads and operational costs, Price competitiveness
3	Allow organisation to focus on core business
4	Easier and more economic access to the latest technologies
5	Improved cost control, Predictable IT costs
6	Higher flexibility, the ability to meet fluctuations in demand
7	Improve efficiency, Improve effectiveness, Be more competitive
8	Improve quality of services and infrastructure
9	Acquisition of specialist expertise and expertise not available in-house
10	Improvement of measurability of costs
11	Organisation gains control over outsourced project management process
12	Availability of new service options, and reduced capital commitment
13	Access to external competencies, Access to best-practice capabilities
14	Access to world-class IT skills via strategic partnership with IT leaders
15	The ability to spread commercial risk, share or reduce risks
16	Possibility of converting fixed costs into variable costs
17	Better control of internal departments
18	Lower involvement (freezing) of capital
19	Make the user department(s) accountable for IT services, a base for the comparison of in-house and outsourcing costs for IT tasks
20	Reduce time – vendor can complete the job faster than in-house team
21	Reduce time by dividing the effort
22	Keep in-house staffing levels more stable
23	Reduce direct employees
24	Facilitate business change
25	Improve response to organisational objectives and strategies
26	Add more personnel to fill a short-term, part-time or transient need for effort
27	Increase IT leverage
28	Aid future planning. Provide solutions for future IT demands
29	Obtain temporary solutions (resolve present difficulties)

No.	Motivation for / Benefit of IT Outsourcing
30	Keep pace with the industry development
31	Acquire innovative ideas
32	Improve credibility and image by associating with superior provider
33	Increase commitment and energy in non-core areas
34	Be able to get penalties for non-performance

The benefits associated with outsourcing have created a large and growing market for IT Outsourcing services. Yet the choice of which services to outsource and which to retain in-house depends on the interplay between benefits and risks. Despite its many advantages, outsourcing involves considerable risks (Quélin and Duhamel 2003; Asif Pasha, 2005), which are addressed in Section 2.3 below.

2.3 Risks involved in IT Outsourcing

Levin and Schneider (1997; p. 38) define risks as *"… events that, if they occur, represent a material threat to an entity's fortune"*. The main source for all risk factors is the complex nature of the IT Outsourcing environment which exposes it to many internal and external pressures. External risk sources are those that the organisation has no control over and which are not affected by its actions. Internal origin risks, on the other hand, are risks that are influenced by and dependent on the organisation's actions (Chandar and Zeleznikow, 2006).

According to Elitzur and Wensley (1998), three types of risks are involved in IT Outsourcing: financial risks, business risks, and technical risks. 'Financial risk', refers to the possibility of financial loss, as there is no IT project which yields certain returns or has fixed costs, known in advance. 'Business risk', refers to the possibility that the system (e.g. application), which was developed for the business, either fails or generates far less revenue than expected. The third risk type, 'technical risk', refers to the possibility of developing a particular IT system which might not function technically. Expanding on the classification of Elitzur and Wensley (1998), Aubert, Rivard and Patry (2001), suggested a new classification of risks including: cost-related risks, function-related risks, supplier-related risks and organisational risks. These different categories are now considered in detail.

2.3.1 Cost-related risks

Cost-related risks include risks such as unforeseen escalation of costs or hidden costs which may arise as a result of insufficient planning or an unexpected turn of events, such as increased management overheads. Hendry (1995) observed that outsourcing can have hidden costs, especially in the longer term, arising from lack of awareness of the changing environment and technology and perhaps unforeseen user requirements. The empirical investigation results of Currie and Willcocks (1997) indicated that the major risk which materialised after initiation of outsourcing was hidden cost. Aubert, Patry and Rivard (2006) asserted that miscalculation and budget overrun can occur because of poor cost management. In order to cope with this unforeseen escalation of costs, Iacovou and Nakatsu (2008) suggested that a risk management plan should be put in place in order to meet the challenge of the hidden costs issues.

2.3.2 Function-related risks

Function-related risks include the failure of the vendor to provide service equivalent to the expectation of the customer (Lacity and Hirschheim, 1993a). As the vendor's objectives are usually quite different from the customer's objectives, this can sometimes lead to a situation of conflicting interests. Additionally, the organisation may eventually lose the capability that has been outsourced altogether. Henderson (1990) argued that when organisations transfer an internal capability to an outside party, they actually lose some control over that capability. Supporting this argument, Aubert, Patry and Rivard (1998) suggested that shortfalls in product performance, disruption of service to the customer, hidden costs, and loss of innovative capacity are all potential risks for IT Outsourcing projects.

2.3.3 Supplier-related risks

Supplier-related risks include the IT service supplier's financial capability, supplier integrity and supplier human resources. Earl (1996) noted that although an IT service supplier may be reliable and able to deliver good service, a change in circumstances may affect its ability to continue operating. Additionally IT service suppliers are not immune to human resource movements, especially if they lose staff that has the necessary skill sets to provide a particular service.

Earl (1996) pointed out that it is important to consider security issues such as possible exposure of sensitive information or intellectual property of the customers if the IT service supplier lacks business ethics or integrity. Lonsdale (1999) warned of the danger of dependency on suppliers. Sakthivel (2007) supported this warning stressing risks stemming from lack of active management by the supplier, incomplete contracting, distrust, and problems involved in knowledge transfer.

2.3.4 Organisational risks

Organisational risks include potential conflict between internal teams and IT service supplier staff, poor communication and unclear measurements of performance and goals' achievements, which may lead to a less than optimal result. According to Kakabadse and Kakabadse (2000) a cultural fit between the IT service supplier and the client organisation is also essential for outsourcing success.

The significance of cultural barriers between customer and provider was also noted by Iacovou and Nakatsu (2008) as a potential risk. Their study produced a summarised risk profile, indicating the top ten risk factors for offshore-outsourced development projects. Although offshore outsourcing is outside the boundaries of the present study, this list of risk factors is especially relevant to the present research topic since it indicates the significance of three main risk areas: communication (including language barriers), client's internal management and vendor capabilities. A further notable finding of this study was that offshore-outsourced projects are more prone to failure than in-house and domestically outsourced projects (Nakatsu and Iacovou 2009).

Laudon and Laudon (1998) produced another typology of risks involved in IT Outsourcing, some of which were noted by the above-mentioned authors, including risk of loss of control; fear of loss of organisational knowledge; cost and complexity of the outsourcing process; risk of losing internal expertise and most importantly, concerns regarding security and confidentiality issues. A review of the relevant literature conducted by Quélin and Duhamel (2003) identified the most frequently named risks of outsourcing as: dependence on the supplier, hidden costs, loss of the organisation's know-how, service provider's lack of necessary capabilities and social risk. Highlighting an additional aspect, Bahli and Rivard (2003) noted that the lack of mutual monitoring and controlling of provider and customer could constitute

significant risks because of the threat of potential opportunistic vendor behaviour and suggested that such risks require some safeguards. Gonzalez, Gasco and Llopis (2004), added that the known inherent risks of IT Outsourcing include failure to meet cost targets, vendors failing to deliver products or services to satisfaction, loss of competencies and vendor lock-in. Tafti (2005) also warned that organisations may confront risks in the areas of individual privacy, data security and loss of IT expertise associated with IT Outsourcing**.**

2.4 Summary

This chapter described extant knowledge concerning the IT Outsourcing phenomenon through a review of the relevant literature, examining possible motivations for its use, and explaining the need to consider the benefits it may bring in contrast to its potential risks. The next chapter also surveys the literature to relate more specifically to IT Outsourcing approaches and theories.

Chapter 3: IT Outsourcing Approaches and Theories

The previous chapter introduced the reader to the IT Outsourcing process and described possible motivations for its use, explaining the potential risks and benefits involved. This chapter describes and discusses the relevant theoretical models that have been developed in this field of knowledge. These theories and models appeared to be the most relevant for this study since they identify and explain characteristics of IT Outsourcing. Like the theories described in Chapter 2 above, they formed part of the conceptual foundation for the present study that helped me to design the research and to comprehend and interpret the empirical findings. Other IT Outsourcing theories that could have been considered for this study were beyond its defined scope, the reasons for these decisions are detailed below.

Several different theories and theoretical models have been proposed to describe and explain the phenomenon of IT Outsourcing, the motivations for its use, and its risks and the benefits, in order to guide organisations' decision-making and determine how IT Outsourcing arrangement can be coordinated and managed most efficiently. Despite its critics, outsourcing is enmeshed into most organisational strategic plans, so that the contract specifying the relationship between IT Outsourcing providers and their clients emerges as a central issue in organisational administration (Saunders, Gebelt and Hu, 1997).

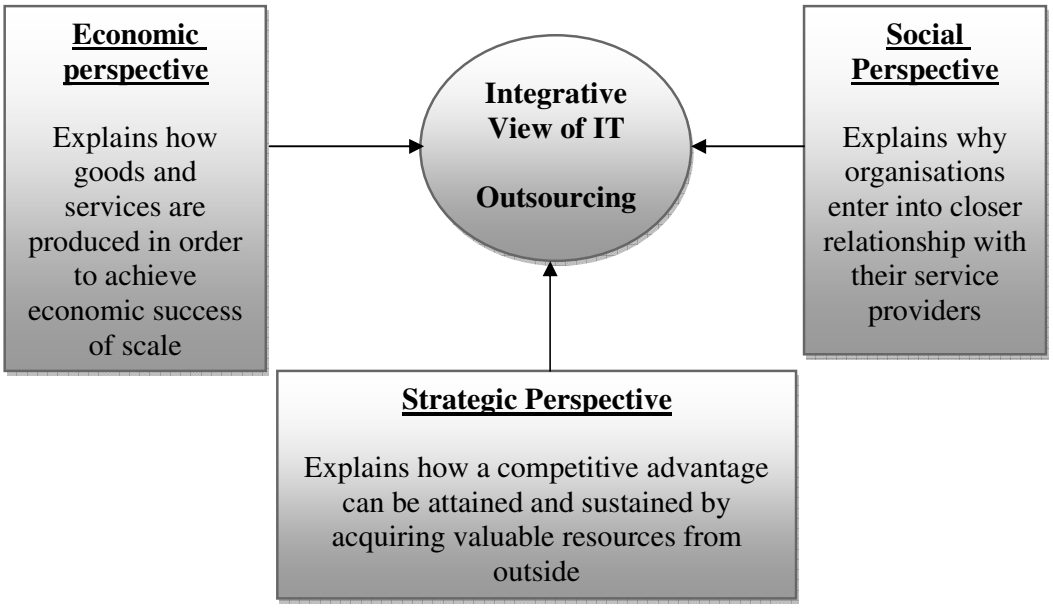
The widespread use of IT Outsourcing in various contexts has influenced the development of theory in different ways. As noted above, as IT Outsourcing grew in popularity, debates shifted from whether or not to outsource, to how much to outsource (Venkatraman, 1997). Researchers also attempted to identify factors and processes involved in effective IT Outsourcing (Loh and Venkatraman, 1995). In order to measure effective IT Outsourcing performance, dimensions such as efficiency, user and business satisfaction, service quality, and cost reduction were assessed in many studies, but comparison of these studies reveals ambiguous and conflicting results.

As noted above, there was a lack of consensus concerning the main motivations for outsourcing. DiRomualdo and Gurbaxani (1998) noticed that early IT Outsourcing arrangements were motivated primarily by operational cost saving, but then the

motivation for outsourcing shifted to the desire for strategic business performance improvement. King and Malhotra (2000) and Currie and Seltsikas (2001) also maintained that organisations' motivation to engage in IT Outsourcing stems from strategic reasons.

Grover, Cheon and Teng (1996) suggested that IT Outsourcing theories should be considered from two perspectives: the 'economic' and the 'strategic management' perspectives. Economically, outsourcing is justified when the proposed tasks can be performed by the provider at a lower total cost, and strategically, when the organisations have capacity and/or capability constraints that prevent their delivering products or services within a required time frame and level of quality. Lee and Kim (1999) argued that a third perspective should be added: the social perspective which considers the relationships between an organisation and its external environment. Later, Lee and Kim (2003) suggested an integrative view, using all the three above-mentioned perspectives to complement and supplement each other since each perspective presents a different emphasis. Figure 3.1 illustrates Lee et al.'s integrative view.

Figure 3.1: The integrative view of IT Outsourcing
Source: Lee and Kim (2003)



As can be seen from Figure 3 above, Lee and Kim (ibid), explained that the integrative perspective reflects the wider spectrum of advantages that organisations can potentially gain from IT Outsourcing, including for example, the issue of mutual trust (organisation-service provider relationship) investigated from a social perspective, cost efficiency explained by the economic perspective, and the subject of competitive gain described by the strategic management perspective, an approach that minimises the limitations of a one-dimensional approach to IT Outsourcing.

In the last decade IT Outsourcing research issues, as well as the theoretical models applied to them, have shifted significantly from the strategic and economic to the social perspective (Cohen and Young, 2005; Overby, 2006), a transition which Lacity et al. (2009) argue is important in order to understand emerging trends in the relationship between the IT Outsourcing providers and their clients.

An overview of documented knowledge and theory relevant to the present research issue is now provided below, classified according to the three perspectives: economic, social and strategic. Among the well-known theories included in this overview are: Transaction Cost Theory, Agent-Cost Theory, Resource-Based Theory, Resource-Dependency Theory, Power-Political Theory and Social Exchange Theory. Other theories such as the Institutional Theory could have been considered for this study but, after due consideration they seemed to be beyond the defined scope. For example: Institutional theory attends to the deeper and more resilient aspects of social structure. It considers the processes by which structures, including schemas, rules, norms, and routines, become established as authoritative guidelines for social behaviour. It inquires into how these elements are created, diffused, adopted, and adapted over space and time; and how they fall into decline and disuse. These issues might provide more detailed understanding concerning the intricacies of the establishment of organisation-outsourcing provider relationship practices but could only provide a marginal contribution to the identification of success factors for the implementation of ERP systems (Meyer, 2007).

Another theoretical framework that was considered is Social Network Theory. A network relationship between actors is a simple form of organisational institutionalisation. Such relations are thought to constrain actors, as well as provide opportunities for their activities. This theory provides a particular perspective on the difficulties involved in organisation-outsourcing provider relationships. Although it

could explain some of the dynamics of the interactions between these two players and indicates that trust relations between the partners are one of the possible success factors for outsourcing, this theory was not considered sufficiently significant to be included within the research conceptual framework (Johnsen, Johnsen and Angeli Arab, 2006).

As noted, the following overview adopts the method used by Dibbern et al. (2004), sorting the different theories into the three distinct categories and indicating their strengths and weaknesses.

3.1 Economic Theories

Economic theories concentrate on the coordination and regulation of economic agents or units in regard to their mutual transactions. Reference theories in this context include Transaction Cost Theory and Agency Theory. These theories intend to explain the characteristics of constructs such as governance or contract (Hallen, Johanson and Seyed-Mohamed, 1991). However, according to Walker and Weber (1984), there is a weakness in a purely economic theory as other important environmental issues and strategic factors that affect an organisation are not considered, and cost efficiency is not the only reason to outsource.

Organisations use the economic perspective to analyse performance and cost-efficiency of IT Outsourcing contracts, and to predict the costs involved, attempting to find ways to minimise risks involved in this process.

3.1.1 Transaction Cost Theory

Transaction Cost Theory was first introduced by Coase (1937) and later elaborated by Klein, Crawford and Alchien (1978) and Williamson (1985). Ronald Coase described the economic efficiency of an economic allocation or outcome in the presence of externalities (social costs). Developing on part of this theory, Williamson (ibid) suggested that, as a result of a costly market, economic efficiency can only be achieved by means of a comparative analysis of production and transaction costs, relating to the costs involved in setting up and monitoring the contract. After a decision is made to outsource, then the aim is to reduce those transaction costs as much as possible. Transaction Cost Theory therefore provides a set of principles for

analysing buyer-supplier transactions and identifying the most efficient way of structuring and managing them (Bryson and Ngwenyama, 1999). Clemons, Hitt and Snir (2000) argued that production cost advantages offered by vendors are significant reasons for IT Outsourcing and these advantages may include the employment of economies of scale, scope, and/or specialisation.

According to Yang and Huang (2000), this theory has often been used for research in the field of IT in an attempt to explain the impact of IT on the boundaries of an organisation. Klein (2004) added that it is especially useful when deciding which IT activities shall be outsourced. Organisations may buy from the market, or develop in-house. The decision to outsource is usually based on the relative cost of their options, composed of the costs of production, and costs of the transaction of the exchange. Williamson (1985) claimed that all the relevant parties to such a transaction may take advantage of opportunities at the expense of others. Opportunist costs arise when a party to a transaction charges more than the marginal cost for the item being transacted.

Schwarz (2005) enumerated four types of transaction costs applying them to the field of IT Outsourcing: 1) Search costs: Costs involved in searching for and evaluating the potential partners. 2) Contract costs: costs relating to the negotiation and writing of an agreement with the outsourcing provider. 3) Monitoring costs: costs to guarantee that all parties fulfil their contractual obligations. 4) Modification costs: costs that arise from either change in performance by the service provider or changes in external conditions.

3.1.2 Agency Theory

Agency Theory identifies the two parties to a business relationship. The principal (the client) who delegates work to the other, and the agent (or vendor) who performs the work, and uses the contract in order to describe the relationship between both parties (Logan, 2000). Kern (1999) identified three types of relationship between these two parties: 1) economic (e.g. the two parties have different goals), 2) competitive (e.g. differences in risk preferences) and 3) partnering (e.g. uncertainty in the exchange process). Agency Theory classifies contractual relationships as either 'behaviour-based' or 'outcome-based'. Outcome-based contracts promise payment by

results, while behaviour-based contracts require the supplier to do certain things at stipulated times, or spend a certain amount of time on certain functions.

Agency Theory was first conceptualised by Eisenhardt (1989) who aimed to determine the most efficient contract to govern the principal-agent relationship by considering factors such as outcome uncertainty, risk aversion, goal conflict, task programmability, outcome measurability and length of the relationship between the organisation and the vendor. Eisenhardt (1989) identified two problems that occur in agency relationships: the first is the potential conflict between the desires or goals of the principal and those of the agent (including the principal's difficulty to verify what the agent is actually doing), and the second is the risk sharing that arises when the principal may prefer to perform different actions because of the different risk preferences. In this context, Bahli and Rivard (2003) argued that the risks involved in IT Outsourcing influence the relationships between the two sides. Agency Theory considers the different risk perspectives of the client and supplier. It assumes that there is asymmetric information and a different degree of risk perception between principal and agent as well as uncertainty. This understanding helps to distinguish the most productive and fairest method of minimising risks for both client and supplier. Dibbern et al. (2004) emphasised the potential for poor outcomes, as a result of wrong decisions. In order to minimise risk, depending on the anticipated costs of controlling the agent, the principal can set incentives in order to ensure that the agent's actions are in line with his own interest and decisions.

3.2 Strategic Theories

Strategic theories deal with an organisation's approach to developing and implementing different strategies. According to Khosrow-Pour (2006) strategic theories try to explain the strategic activities which an organisation uses in order to accomplish a desired performance goal. Reference theories found relevant for this research in this context include Strategic Management Theories and Resource Theories: Resource-Based Theory and Resource Dependency Theory.

3.2.1 Strategic Management Theories

Strategic Management Theories relevant to this research are Chandler's Strategy Definition and Porter's Theory of Strategic Advantage. Chandler (1962) defined strategy as the determinant of the basic long-term goals of an enterprise, and the adoption of courses of action and the allocation of resources necessary to carry out these goals. Porter's Theory of Strategic Advantage (1985) is generally referred to as the Five Forces Model and relates to the following five elements: (1) competition between existing sellers in the market, (2) power exerted by customers in the market, (3) impact of the suppliers on the sellers, (4) the potential threat of new sellers entering the market, and (5) the threat of substitute products becoming available in the market. Thurlby (1998) argued that understanding the nature of each of these forces gives organisations the necessary insights to enable them to formulate appropriate strategies to succeed in their market.

3.2.2 Resource Theories

Resource theories view an organisation's resources as the sole foundation for the implementation of the organisation's strategy. The organisation's resources are the inputs or the factors available to the organisation which help it to perform its operations and carry out its activities (Grant, 1991). The organisation's objective is to attain and sustain a competitive advantage by acquiring the needed resources either internally or externally. Resource theories help to distinguish which functions an organisation should keep internally, and which IT activities could be outsourced. Questions such as the value of the resource and its rareness are some of the main issues considered in these theories (Daft, 1992). The following two resource theories contributed to an understanding of the studied phenomenon in this study:

Resource-based Theory

Resource-based theory considers that an organisation's resources encompass all the assets, organisational characteristics, processes, skills, information and knowledge that are controlled by the organisation itself and its employees (Barney, 1991). Grant (1991) extended this view by categorising five types of resources: financial, physical,

human, technological and reputation, where the first two represent tangible resources while the last three constitute intangible resources.

Cheon et al. (1995) suggested that Resource-based Theory focuses on an internal analysis of an organisation relating to its resources and capabilities. The organisation's internal resources are considered primary, as organisations wish to maintain a competitive advantage and to reduce gaps in resources and capabilities using the best cost-effective option. Additionally, an organisation can only gain competitive advantage if the organisations resources are heterogeneous. If an organisation is not self-sufficient, it is more dependent on external resources and, therefore, needs to divert energies to managing external dependence (ibid).

Developing the concept of organisational self-sufficiency, Roy and Aubert (2001) argued that an organisation is competent when its unique resources are exploited and organised to represent a source of competitive advantage. From an IT standpoint, these unique resources can be found in technical skills such as analytical and design expertise, the ability to integrate emerging technologies and managerial skills such as the ability to effectively develop appropriate IT applications or establish a link within the user community. Roy and Aubert (ibid) explained that any lack of available resources will lead an organisation to seek to overcome this deficiency by contacting external expertise and possibly partnering with them through outsourcing. Finally, Gottschalk (2006, p.157) employed a resource-based theory perspective to suggest certain measures to be taken in order to successfully manage IT Outsourcing arrangements since this perspective: "*provides the capability to integrate and exploit strategic IT resources from the vendor together with own resources to produce competitive goods and services*".

Resource Dependency Theory

Resource Dependency Theory provides a perspective from which the correlations between an organisation's decisions may be observed. It focuses on various resources in the organisation's external environment. Organisations adopt various strategies to gain access to critical resources, to stabilise relationships with the external environment and to secure survival (Pfeffer and Salancik, 1978).

The organisation's survival depends on its capability to gain control over its external environment, acquisition of necessary resources from the environment and its

linkages with that environment (ibid; Pfeffer, 1982). Although the external acquisition of resources can result in a level of dependence between the client and vendor despite this risk, organisations will enter into exchange relationships with other organisations to obtain critical resources that cannot be generated internally.

Three factors determine the organisation's degree of external dependence: (1) the extent to which an organisation requires resources for sustained survival; (2) the extent to which an interest group or other organisation has discretion over the resource allocation and use; (3) the extent of control over the resources by an interest group or other organisation, such as the existence of a monopoly that determines the organisation's dependence (ibid).

Boyd (1990) indicated that the organisation's environment is very important as a source of resources. He defined 'market environment' as a set of organisations that engage in exchange relationships with one another. Cheon et al. (1995) concluded that the level of the organisation's dependence on another organisation is established by the importance of their resources to the organisation, the number of potential suppliers and the cost of switching to work with another supplier. In order to check the influence of this dependency on the organisation, Willcocks and Lacity (2001) analysed hundreds of case studies. They determined that the decision to outsource critical IT applications increased the organisation's dependency on the external entity. Similarly Kern and Willcocks (2002) analysed several outsourcing relationships and concluded that too much dependence on vendor's performance is risky.

3.3 Social Theories

Social theories such as Power and Politics Theories, Relationship Theories, and Social Exchange Theory focus on the different types of relationships that exist between individuals, groups and organisations. In outsourcing research, social theories are mainly used to explain partnership relations between clients and service providers (Klepper, 1994), where the client-service-provider relationship is seen as a series of dynamic processes occurring in specific sequential interactions when two participants carry out activities toward one another and exchange valuable resources (Teng et al., 1995).

3.3.1 Power and Politics Theories

Pfeffer (1981) paid considerable attention to issues of social power and influence processes and at the macro-level of analysis, his research sheds light on the structural and environmental factors that affect the distribution of power in organisations. Pfeffer (1981) suggested that power, idiosyncratic interests and also politics play major roles in an organisation's decision-making process. DeLooff (1997) explained that power and politics can influence a decision-making process in the field of IT Outsourcing at three different stages: (1) in the decision-making process itself, (2) in the investigation of the expected distribution of power, (3) in the design and management of the outsourcing agreement.

Lacity and Hirschheim (1993a) found that some IT managers used political tactics to underline the efficiency of their department towards top management, by requesting bids from expensive suppliers. This behaviour demonstrates that decision makers may seek to achieve other objectives than the best interest of their department or organisation during the decision-making process, employing other manipulative tactics aside from common arguments or research results. The client organisation has a unique source of power as its decision makers define which IT activities to award to a specific supplier or whether or not to offer follow-up contracts. DeLooff (1997) recommended that the client organisation should carefully analyse the expected distribution of power with the possible suppliers and aim to ensure a constant balance of power between themselves and their suppliers by designing the preferred relationship.

3.3.2 Relationship Theories

Relationship theories consider social and economic exchanges including cooperative interactions as pivotal factors in inter-organisational relationships. Klepper (1995) and Kern (1997) suggested that organisations should ensure that the outcomes of an exchange agreement between parties would be greater than those that could be achieved through alternate forms of exchange or from exchange with a different partner. Beulen and Ribbers (2002) focused on ways to improve the relationship between the outsourcing providers and outsourcing customer.

Dibbern et al. (2004) indicated that relationship theories were applicable to strategic management topics such as alliances, competitive advantages and supplier-buyer relationships, since they focus on interactions between parties that are motivated towards joint accomplishment of the individual parties' objectives. Although the strength of the relationship theories is their focus on the inter-organisational relationship and the exchanges that constitute the client-service-provider relationship, one of their weaknesses is a failure to highlight the environment or the context in which the relationship takes place (Kern and Willcocks, 2001).

3.3.3 Social Exchange Theory

Social Exchange Theory relates to the exchange of activities (tangible or intangible as well as rewarding or costly) between two or more people (Homans, 1961). Blau (1964, p.91) defined social exchange as: *"Voluntary actions of individuals that are motivated by the returns they are expected to bring, and typically do in fact bring, from others*".

Emerson (1972) indicated that the pivotal components involved in any social exchange between clients and vendors are: 'reciprocity', 'balance', 'cohesion' and 'power'. Interaction between two actors (people, organisations etc.) results in various contingencies, so that the actors are motivated to modify their resources and reactions to each other's expectations. This process involves 'reciprocity', or the mutual exchange resulting from the need to reciprocate when benefits are received. 'Balance' refers to the individual degree of dependence that the actors have vis-a-vis their partner in the exchange. 'Cohesion' is the ability of the parties to continue their relationship, especially when it comes under strain, as when conflict arises, and 'power' is the ability of one party to impose costs on the other (Dibbern et al., 2004).

3.4 Summary

This chapter has presented three relevant theoretical perspectives (Economic, Strategic and Social) and their constituent theories and indicated their relevance for IT Outsourcing research. When all three perspectives are combined this forms an integrated holistic perspective on the studied issue. Table 3.1 below describes the characteristics of major theories relating to IT Outsourcing.

Table 3.1: Characteristics of major theories used in IT Outsourcing research
(Source: Lee et al., 2003)

Orientation	Theory	Focus	Resource	Main constructs
Strategic Management Perspective	Resource Based	Internal slack resource	Physical capital, Human capital, Organisational capital	1. Value, 2. Rareness, 3. Imperfect immutability, 4. Non-substitutability
	Resource Dependence	External resource (Uncertainty)	Land, Labour, Capital, Information, Products (service)	1. Task dimensions (Concentration, Munificence, Interconnectedness) **2.** Resource dimensions (Importance, Discretion, Alternatives)
Economic Perspective	Transaction Cost	Cost-efficiency (Economics of scale)	Production cost, Transaction cost	1. Asset specificity, 2. Uncertainty, 3. Infrequency
	Agency Cost	Principal-agent relationship (Contracts)	Monitoring cost, Bonding cost, Residual loss cost	1. Uncertainty, 2. Risk aversion 3. Programmability, 4. Measurability 5. Length of relationship
Social Perspective	Power Political	Power-structure relationship	Power, Politic	1. Power (Authority, Resource acquisition, Dependency and low substitutability, uncertainty absorption) **2.** Political (Selective use of decision criteria, Selective use of information, Use of outside Experts, Building coalitions, Co-optation)
	Social Exchange	Interaction processes	Trust, Culture	1. Comparison level, 2. Comparison level for alternatives

Table 3.1 above sums up each individual theory, categorised by the perspective which it reflects. (For more detailed information about these theories, their specific focus and supporting literature, see Appendix 3.1).

Chapter 4: ERP and IT Legacy Systems

This chapter explores the relevant literature to provide background information concerning outsourcing services in Israeli Enterprise Resource Planning (ERP) systems. It discusses the characteristics of ERP systems, the motivations for implementation of such systems, and their benefits and drawbacks. It relates to the lifecycle of ERP, then describes and discusses the unique characteristics of ERP systems compared to IT legacy systems and other in-house developed systems, and the shift from IT legacy systems to ERP. The chapter also considers the issue of relations between IT service providers and the ERP community, pointing up factors which have been identified as important in order to achieve successful outcomes.

Simon (2002) highlighted the challenges that an organisation has to overcome in the current business world: changing business environment, tight competition in global markets, the widely spread information networks and business networking, which all impose requirements for IT systems' service capabilities. In order to be efficient, organisations need to integrate their functions and processes and share information fluently without any unnecessary delays inside or outside of the organisation. In many cases, the implementation of an ERP system is considered to provide the appropriate response to these needs. According to Akkermans and van Helden (2002), during the last decade ERP systems' implementation has become one of the biggest challenges in IT enterprises as many organisations needed to replace their out-dated and cumbersome 'legacy systems'. ERP has become a priority for those organisations that choose to switch to purchased software packages, rather than constructing a new system by themselves (Garvey, 1999).

4.1 Defining ERP

Balls et al. (2000) described an ERP system as an IT solution, which connects various components of the enterprise through a logical transmission and data sharing. Seddon et al. (2003) defined the ERP system as a packaged business software system that allows an organisation to automate and integrate the majority of its business processes, and share common data and practices across the entire enterprise. The

main concept underlying an ERP system is that it is built on one database and a single application, and provides a unified interface across the entire enterprise.

4.1.1 Characteristics of ERP systems

According to Hedman and Borell (2004), the ERP phenomenon has been found to have conceptual links with almost every area of IT research. ERP represents a technological development which first began with the evolution of Material Requirements Planning (MRP) systems for manufacturing processes, and then grew to Manufacturing Resource Planning (MRP II) systems (Chung and Snyder 1999).

Davenport (1998) asserted that the primary function of ERP is to integrate and standardise information and processes. It therefore attempts to improve integration across different functional departments, emphasising core business processes, and enhancing overall competitiveness.

According to Davenport (2000b) ERP systems have several common characteristics, such as a modular construction (containing a selection of application modules), which is based on a client/server architecture (whether traditional or web-based). Attempts are made to configure the ERP system to the organisation's business needs, using a common (usually relational) central database, and variable interfaces (e.g. different languages and currencies used by an organisation). O'Leary (2000) also noted that ERP systems integrate the majority of a business's processes to allow easy access to data in real time, and that they actually process a large majority of an organisation's transactions. Hanseth, Ciborra and Braa (2001) agreed that ERP led to better integrated streamlining and standardisation of business processes, while noting that ERP also developed supervision and control technology.

Esteves and Pastor (2001) argued that ERP systems usually offer a generic solution, but when organisations discover that their way of doing business is not supported by the new system, ERP can be customised to cater for their specific needs. Gefen (2002) also noted that since ERP is package-based generic enterprise software, consequently implementation mainly entails customisation and integration of its many modules to a specific organisation. However, Sumner (2000) and Light (2001) have criticised the ERP option pointing out that it is very expensive and may lead to problems such as the incompatibility of product patches and new versions with the

customised ERP software. To avoid excessive customisation, Davison (2002) suggested that when the organisation does not want to modify itself, but still wants to gain the standard functionality provided by the packaged ERP systems, it should select the software that best fits its needs with the least amount of customisation in order to avoid later maintenance problems and organisational misfit.

Myerson (2002) enumerated the benefits from an ERP solution: an organisation can quickly upgrade its business processes to industry standards, taking advantage of the many years of business systems' reengineering and integration experience of the major ERP service providers. But, Verville and Halingten (2003) warned that ERP acquisition processes are complex, demanding and intensive.

Skok and Legge (2001) noted that an ERP system is developed, selected, implemented and used in a particular socio-technical environment and it therefore constitutes a 'social activity system'. This approach reflects the view of Orlikowski and Iacono (2001) that three main elements should be considered in order to understand IT and its deployment in organisations: human agents, technology, and institutional properties (such as culture).

4.2 The shift from legacy systems to ERP

IT legacy systems and other in-house developed systems were built up over the years through huge investments according to the organisation's specific needs (Good, 2002). Typically, these systems served multiple business functions, but had separate sets of components and were only connected by interfaces. Legacy systems still in use today utilise outmoded programming languages, software and/or hardware that typically are no longer supported by the respective providers and are considered as 'old' systems by the organisation. They are hard to maintain, improve, and expand because there is often a general lack of understanding of the system, since the employees who had the necessary expertise have retired or forgotten what they knew about it; and this may lead to lack or loss of documentation.

According to Erlikh (2001), finding IT professionals willing to work on obsolete technology can be very difficult, and legacy system maintenance therefore often involves high cost investments. This difficult problem can usually be resolved by replacing the older information system with modern packaged software and hardware

from any one of a variety of ERP vendors, such as Oracle, and SAP and other local suppliers, yet this transition involves difficulties of its own.

Since the move to more modern solutions becomes inevitable with time, ERP is not just another IT system, but has actually become a dominant phenomenon in today's enterprises, implying dramatic changes when compared to the traditional IT systems. The present discussion does not therefore provide any further analysis of existing legacy and in-house developed systems, but attempts to consider how the move towards ERP systems impacts on the nature and dynamics of the researched issue, IT Outsourcing.

Implementing an ERP system often constitutes an organisation's largest-ever IT investment, and in many cases it is their largest-ever enterprise project (Sumner, 2000). Gunson and de Blasis (2001) explained that the transition to ERP from traditional IT systems influences the organisation's role content and hierarchy as certain professions appear for the first time, and others evolve. Some of the new roles are: 1) the super-user who acts as the reference point for end users, 2) the IT software specialist who manages conversion, interfaces, modification and the integration of new versions, and 3) the database administrator who ensures the integrity of databases and master files. On the other hand, certain professions disappear, for example: the internal software developers, who transformed user needs into programme lines that were used to bring quick programming solutions written with relatively old programming languages, isolated from other software programs running in the organisation. However, the transition to ERP entails a new problem: source code writing complexity and interdependency. Before ERP, and with in-house developments, it was relatively easy to isolate a program chain, to intervene and make corrections. However the ERP source code is too complex and the IT specialist must have better knowledge in order to master the information (Gunson and de Blasis, 2001).

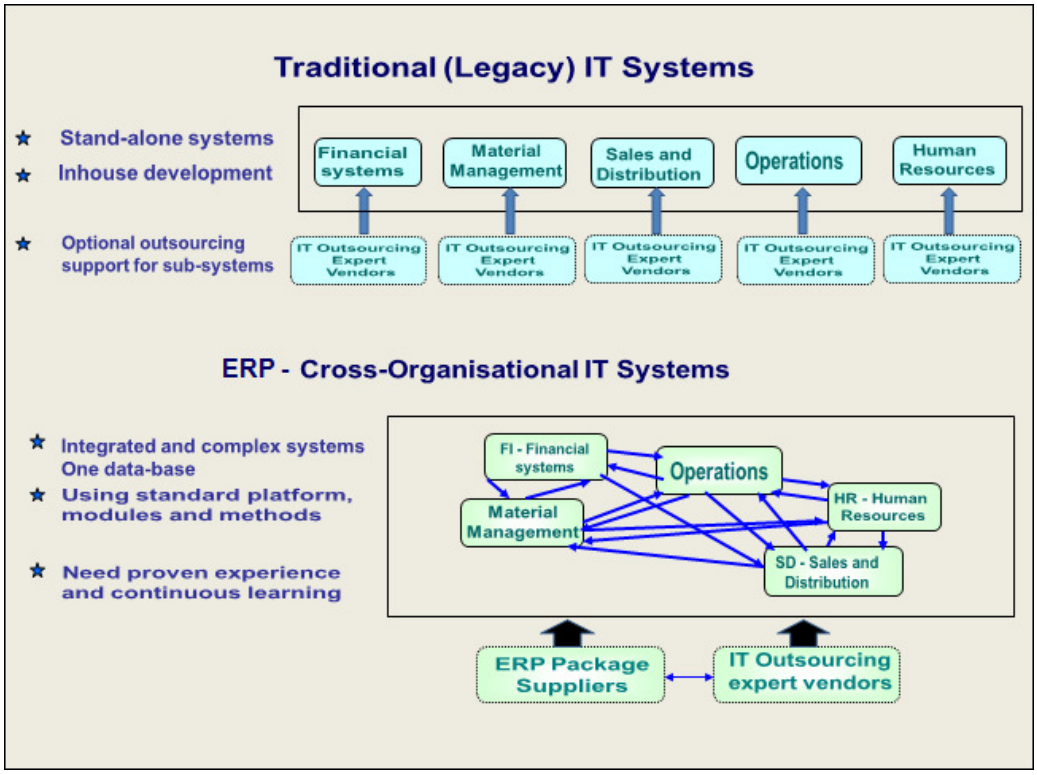
Another issue involved in the transition from legacy systems to ERP is the use of the 'best practice' option (Davenport and Brooks, 2004). 'Best practice' is the business model used in ERP software that applies methods and approaches which have been found to produce the optimum outcomes in similar contexts across the industry or sector for all businesses uniformly (Stenbeck, 1998a). This is a well-defined method employed in ERP, developed by refinement over many years of trial and error

(Stenbeck, 1998b), which offers experienced knowledge in product development to provide maximum efficiency. As noted above, since 'best practice' is a uniform solution, often applied 'as is', it may be necessary to customise the products to fit the organisation's specific needs, with consequent costs. Haines et al. (2003) indicated that use of this strategy necessitates the best experts with broad hands-on experience in other enterprises to carry out the customisation work but usually they cannot be found internally or suitably trained in-house.

Light and Papazafeiropoulou (2004) summarised the characteristics of ERP systems in contrast to legacy systems: ERP systems are complex, centralised and critical cross-organisational systems that are very costly to implement (hundreds of thousands or millions of dollars). These costs may include implementation assistance cost, system integration cost, reengineering cost, and the cost of changing an organisation's IT architecture to support ERP technology (Cotteleer, Austin and Escalle, 2003). A further consideration in such transitions, depending on the implementation strategy that the organisation adopts, is that ERP projects are often long and intensive and a variety of unexpected 'cost' factors may escalate the initial budget.

Thus, the centralised unified ERP systems differ significantly from the many separate standalone sub-systems in the legacy IT systems that were usually built from scratch. However, an organisation either has to customise the software or change its own processes to conform to the business processes offered by the new ERP software designers. The first option is necessary if its original system was custom-made and provided a critical business advantage. The following figure, Figure 4.1 demonstrates the difference between the two types of IT systems:

Figure 4.1 Comparison of legacy and ERP systems



4.2.1 Reasons for acquiring ERP systems

Deciding to invest in an ERP system is a top-management decision, which has a significant impact on an organisation's culture, processes, structures and strategies (Davenport, 2000b; Kennerley and Neely, 2001; Davison, 2002).

Hallikainen, Laukkan and Sarpola,(2004) synthesised and categorised the different reasons for ERP system acquisitions mentioned in previous research, dividing them into 'technological' and 'business' reasons. The prevalence of the different reasons was explored in empirical data concerning ERP acquisition in 41 Finnish organisations. The study indicated that:

- 'Technological reasons' include the need for new IT systems (Hecht, 1997), the option to outsource software maintenance and development (Kremers and Dissel, 2000), the need for a common technological platform and increased standardisation in technologies used across the organisation (Sumner, 2000), IT cost reduction (Klaus et al., 2000), and the desire to replace the aging IT architecture or technology with more modern systems (Brown et al., 2000);

- 'Business reasons' include: the desire to facilitate change in the ways of doing business, in order to improve effectiveness or to gain strategic advantage (Fitzgerald, 1998), the desire to move to a standardised IT (Klaus et al.,2000), the desire to adopt 'best practice' business models, and to reengineer business process (Parr and Shanks, 2000b), the need for increased flexibility and agility in doing business (Brown et al., 2000), the desire for improved data visibility and integration to aid managerial decision-making and operations (Ross and Vitale, 2000), pressure from the value chain and need for electronic networking and collaboration with customers, suppliers and other business partners (Hayman, 2000).

Additionally, Nah (2002) suggested that organisations aspire to focus on their core business and benefit from truly value-added activities that they can purchase from outside entities. Such activities can cover accounting and financial management, human resources management, manufacturing and logistics, sales and marketing, and customer relationship management. However, Ross and Vitale (2000) pointed out that the different reasons and motivations for acquiring ERP systems partly overlap and are interdependent, both within as well as between the two above-mentioned categories.

4.2.2 ERP benefits and drawbacks

As noted above, organisations spend significant resources, money and time implementing ERP solutions in order to achieve maximum benefits. Davenport, Harris and Cantrell (2002) identified the top ten benefits that can be gained from an ERP implementation: improved management decision-making, improved financial management, improved customer service and retention, smooth growth and increased flexibility, faster, more accurate transactions, headcount reduction, cycle time reduction, improved asset management, better logistics, and increased revenue. Adopting a strategic perspective, Seddon et al. (2003) then indicated that there are five types of benefit from ERP implementation: Operational, Managerial, Strategic, IT infrastructure, and Organisational (See Appendix 4.1).

ERP systems tend to be large and complicated and as noted, ERP system delivery and implementation is complex, costly, and highly problematic (Doyle, 2000; Mabert, Soni and Venkataramanan, 2001). The implementation of ERP implies new

procedures, employee training, and both managerial and technical support (Shang and Seddon, 2002). Additional drawbacks mentioned in the literature include: implementation complexity (Martin, 1998), integration problems (Linthicum, 1999), customisation problems (Glass and Vessey, 1999), going over budget and late delivery of projects (Davenport, 1998), organisational change and resistance to change (Sumner, 1999). Additionally Davenport (1998) noted that business strategy and competitive advantage might be affected by difficulties in integrating the system due to lack of alignment between people, processes, and the new technology. James, Dorien and Wolf (2000) found that for many organisations installing ERP was hectic and difficult in contrast to the software suppliers' promise of efficiencies such as shorter intervals between orders and payments, lower back-office staff requirements, a reduced inventory and improved customer service, benefits which often did not materialise in practice.

4.2.3 ERP lifecycle and knowledge needs

Traditional models that describe the software lifecycle are based on custom-developed software and legacy systems so that a separate model is needed to describe the ERP Systems software lifecycle. Attempts to form such a model by Markus and Tanis (2000) and Ross (1999), suggest that the process of integrating ERP systems software into an organisation, typically consists of four main phases: (1) acquisition ('Chartering'), (2) implementation ('The Project'), (3) stabilisation ('Shakedown') and (4) operation and improvement ('Onward and upward'). Dibbern et al. (2002) indicated that these phases that together represent the ERP lifecycle are each composed of relevant specific technical and functional activities:

- 'Technical activities' relate to the IT infrastructure (including installation and maintenance of the server, the computer at the workplace, the network, monitoring and optimisation of the database, the operation of the ERP system, memory management, user management, as well as printer and spool management),
- 'Functional activities' relate to functionality provided by the ERP system and its use (including the configuration of the ERP package, possible modifications, integration and tests of the ERP system, training of the end user, and organisation of roll-outs).

Following the organisation's decision to deploy an ERP package, the 'acquisition' phase includes choice of infrastructure and software program according to specifications defined by the organisation and the selection of the appropriate ERP package. It also includes the planning of the implementation project (e.g. time schedule, budget and project leadership). According to the findings of Dibbern et al. (ibid), this process may last several months.

The next phase, 'implementation' includes the installation of the IT-infrastructure and the ERP software package according to the predefined target, conceptualised according to a detailed description of the business processes to be supported. The findings of Dibbern et al. (ibid) indicated that this phase may last from six months to three years. They also considered it the most difficult phase as it involves many complicated activities such as: configuring and possibly modifying the ERP package, building interfaces to other systems and data conversion, testing and rectifying errors, training end-users (including the preparation of user documentation), roll-out and switching to productive operations. The 'stabilisation' phase generally continues for several months or sometimes even years, providing modification of business routines and improving the system's performance. This is followed by the 'operation and improvement' phase, during which the ERP system is supplemented with new functions through the deployment of updates and new releases suitable for the organisation and its market needs. This phase establishes the day-to-day operation of the system, supported by a continuous improvement process and system tailoring. The findings of Dibbern et al. (ibid) indicated that the operation and improvement phase concludes with the de-installation of the ERP system or introduction of yet another newer information system.

The different stages of the ERP system lifecycle require different types of skills and knowledge. When these are not available in the organisation's internal resources, they are purchased from outside entities according to the appropriate outsourcing decision. Light, Holland and Wills (2001) suggested that because of the integrative nature of ERP systems, external support resources should ideally have the kind of knowledge and maturity gained by working in many other large organisations, so that they will be able to grasp the whole organisational structure and workflow and suggest appropriate solutions. Dibbern et al. (2002) noted that ERP vendors should be well-informed and skilled in three different knowledge categories (See also

Appendix 4.2: The categorisation of knowledge needs in the lifecycle of the ERP by Dibbern et al., 2002):

1. *Basic knowledge* concerning the IT-infrastructure and ERP: refers to technical tasks in the ERP lifecycle such as knowledge of hardware (e.g., server, computers at the workplace, networks, and software) and basis services of the ERP package (data bank, ERP core, user management).
2. *Programming knowledge*: includes knowledge of the ERP package's programming language (e.g., ABAP/4 in SAP R/3) and the ERP software's architecture. This knowledge is necessary in order to be able to modify and adjust the ERP package.
3. *Functionality knowledge*: refers to the functionality available in ERP software packages that reflects the reference processes depicted in the software. It includes knowledge of the full range of parameters and their configuration settings.

4.2.4 IT service providers and the ERP community

Based on the findings of their extensive research, Mitchell and Fitzgerald (1997) distinguished five different types of external IT service providers or freelancers (as they were described by Knolmayer, 2002) in the ERP field: (1) consultants, (2) systems integrators, (3) hardware providers, (4) former IT departments managers and workers, and (5) generic outsourcers. These external providers usually have the experience and the knowledge which the organisation's internal resources lack.

Westrup and Knight (2000) argued that the large scale of ERP system implementation means that organisations can rarely complete the integration of these systems using only internal resources. However, ERP vendors (such as SAP and Oracle packages) also have their limits and cannot provide complete support for every installation process because of the rapid growth in the number of implementations.

Caldas and Wood (1998) found that 91% of the implementation processes were conducted with the assistance of management consultants. This was corroborated by Rutherford (2001) who found that over 90% of organisations are "aided by an army of consultants" (cited in Sammon and Adams, 2002, p.1008).

According to Hossain and Shakir (2001a), external consultants are intensely involved throughout an ERP project, so that they are motivated to guide the selection and implementation of ERP. Noting the steady relationship that developed between the implementing organisation, the ERP vendor, and the ERP consultant, they identified these three parties (client, vendor and consultant) as the main *de facto* stakeholders in the ERP community. The client, as the implementing organisation, depends on the offerings of the ERP vendor and the services of the ERP consultant. Together these three entities for, what is known as the 'ERP community'. But, Donovan (2001) warns that when using external resources to fill a skills gap in the implementing organisation, it should be taken into account that consultants may not be genuinely qualified and suitably experienced to reduce the high risks involved in implementing an ERP system.

The study by Sammon and Adam (2002) entitled *Decision making in the ERP community*, is one of the few sources that relate to the 'triad' concept proposed by Hossain and Shakir (2001b), and attempts to understand the mutual relationships between these actors. The authors identified different types of relationships between clients and consultants, which may range from the relationship between the indispensable-consultant and the dependent-client to relationships where the client can become more independent, including other grades of relationship with varying degrees of mutual cooperation (Bloomfield and Danieli, 1995).

While it is true that the external providers are familiar with the ERP system and have specialist knowledge regarding the system, the clients possess the knowledge relating to their specific business. Dibbern et al., (2002) investigated how this asymmetry of knowledge evolves during the various phases of the ERP lifecycle, what skills and knowledge are needed in each phase, and how ERP service providers realise their specialist advantages and past experience. They made a knowledge-oriented analysis of tasks in the ERP-lifecycle and correlated this typology with the alternative internal and external stakeholders, i.e. task/knowledge carriers inside the organisation and the outsourcing 'players'. Thus, a possible classification scenario for the 'configuration' task for example, would indicate that the required knowledge is distributed asymmetrically: ERP functionality knowledge is located in the consultant, while functional employees in the internal IT department of the organisation and main

users hold the business process knowledge. More details concerning the findings of Dibbern, et al., (ibid) are presented in Appendix 4.3.

Relying on the triad concept, Somers and Nelson (2004) described five elements involved in the ERP consultant-vendor-client organisation interactions in the implementation of ERP systems. It is noted that some of these processes are parallel to and overlap processes noted by Hossain and Shakir (2001b), and Dibbern et al. (2002):

1. *Vendor-Client Partnerships*: This relationship between the vendor and software buyer should be strategic in nature, so that the ERP provider's role is to enhance an organisation's competitiveness and efficiency, and satisfy customer demands.
2. *Vendors' Tools*: such as rapid implementation technologies and programs used during the adoption and adaptation process in order to reduce the cost and time involved in deploying ERP systems. In order to transfer knowledge about the use of the software, it is important that the vendor should understand the business processes within the organisation, and recognise best practice.
3. *Vendor Support*: this is required along the lifecycle of the ERP systems as organisations continue to invest in new modules and upgrades to add functionality, achieve better fits between business and system, and realise their strategic value. Nicolaou (2004) also asserted that vendor support for packaged software is very important during the post-implementation stages and to be effective should include extended technical assistance, emergency maintenance, updates, and special user training.
4. *Customisation:* as already noted above, software modification and customisations are required for the ERP system to meet the needs of the organisation (Scott and Kaindl, 2000). Zrimsek and Geishecker (2002) argued that customisation is a crucial matter that influences the essence of the relationship between all the ERP community entities, and that it is important to provide the best possible adaptation to the organisation's needs as the software vendors do not usually support customisations in future versions of their software. The software will need special maintenance and upgrades each time a change is required to the system. Also, moving away from the standard software program means not benefiting from the advantage of an integrated system with one input of

transaction data. According to Nah, Zuckweiler and Lau (2003), numerous studies on ERP implementation conclude that the preferable way to implement ERP software is without or with only minor essential software modifications.

5. *Implementation Consultants*: the outside consultants' experience, comprehensive knowledge of certain modules, and experience with the ERP software is a main resource for organisations in all the activities required for setting up and running their systems. The ERP consultant may be introduced into the ERP project at a very early stage, performing the role of a business analyst, or organising the selection of existing packages, and/or may be introduced as an implementation partner to the selected ERP vendor whose ERP product is being implemented. According to Davenport (1998) consultants can perform the role of change facilitator and are involved in every important knowledge transfer. They can also offer an organisation-wide view, encourage unity between members, and they are usually neutral. Gable (2003) maintained that consultants can provide specialised skills, experience, and know-how that the organisation needs when it is both time-consuming and expensive for it to build these resources internally. However, Themistocleous and Irani (2001) noted that conflict with consultants is one of the main managerial problems during the implementation period of an ERP system. Brown and Vessey (2003) cautioned that it is important to ensure that the professional quality of consultants is up to standard. They also indicated that apart from having systems knowledge, consultants should be able to demonstrate a mastery of professional communication skills, good language capability, industrial knowledge, and business analytical skills, since it might otherwise be impossible for them to act as agents of change. Chang (2004) identified three requirements with which consultants need to comply in order to properly support an ERP system, although consultants who meet all these demands are often very difficult and costly to recruit: 1) Consultants must be skilled in ERP itself, and these skills alone are very important, 2) Consultants must be familiar with the technology (i.e. they need to understand computing technology and what it can do for the business), 3) Consultants must acquire an understanding of the business's practices. Kim, Lee and Gosain (2005), asserted that the consultant plays an essential role during the implementation stages and

also in the operational phases, but warned that employing incompetent consultants can cause ERP projects' failure.

The studies mentioned in this sub-section describe the tie created in the ERP development process between the organisation and two external ERP providers considered crucial to its success: the ERP generic package suppliers and the ERP consultants, who play critical roles in the implementation and adaptation of the package to the organisation. These three players: organisation, generic package suppliers and consultants constitute the triad that forms the ERP community.

4.2.5 Success factors for ERP

The measurement and evaluation of the performance of IT systems are critical processes in order to ensure the success of any organisation (Zairi, Al-Mudimigh and Al-Mashari, 2009). Somers et al. (2000) suggested that the high failure rate of ERP implementation in the early stages of its existence calls for a better understanding of its critical success factors. A critical success factor (CSF), represents an element of an organisation's activity which is central to its future success (Hossain and Shakir, 2001a). It may change over time, and may include items such as product quality, employee attitudes, manufacturing flexibility, and brand awareness (Johnson and Friesen, 1995). The concept of CSF was introduced by Rockart (1979) as a mechanism to identify the information needs of chief executive officers in order to ensure successful competitive performance for the organisation. Since then the current use of CSF has been expanded to cover all legitimate areas of management and has become a widely used technique for identifying the critical concerns of IT managers. Today, the CSF concept is increasingly used by IT consultants and IT departments as a means of support for IT strategic planning (Esteves, 2004).

Markus and Tanis (2000) used a process theory approach to classify the CSFs. The process theory focuses on the sequence of events leading up to implementation completion and also keeps track of CSFs during the life cycle of the system. They identified CSFs at the following four phases in an ERP life cycle: 1) ‘Chartering’, in which decisions are made that define the business case and solution constraints; 2) ‘The Project’, in which system and end users are up and running; 3) ‘Shakedown’, including stabilisation, eliminating 'bugs', getting down to normal operations; and 4)

'Onward and upward', including systems maintenance, supporting users, getting results, upgrading, system extensions.

Markus and Tanis (ibid) argued that implementation success is a multi-dimensional and dynamic concept, i.e. there is no single measure which can capture all dimensions of ERP implementation success and appropriate measures differ for different points and phases in time. In addition, it should be remembered that definition and measurement of ERP's successful implementation is relative to some type of benchmark and depends on who defines success. Project managers and implementation consultants often define success in terms of completing the project on time and within budget, while ERP systems users are interested in achieving business results and therefore tend to focus on the establishment of a smooth transition to stable operations with the new system improvements.

Esteves and Pastor (2001) constructed a unified model, which categorises two types of identified CSFs (Strategic and Tactical) in two different dimensions (within the Organisation and in respect to Technology). Table 4.1 below sets out this model:

Table 4.1: Unified critical factors model (Source: Esteves and Pastor, 2001)

	Strategic CSFs	**Tactical** CSFs
Organisation	• Sustained management support • Effective organisational change management • Adequate project team composition • Good project scope management • Comprehensive business re-engineering • Adequate project champion role • Trust between partners • User involvement and participation	• Dedicated staff and consultants • Appropriate usage of consultants • Empowered decision makers • Adequate training programme • Strong internal communication and outwards communication with outside entities • Formalised project plan/schedule • Reduce trouble shooting

	Strategic CSFs	**Tactical** CSFs
Technology	• Avoid customisation • Adequate ERP implementation strategy • Adequate ERP version	• Adequate software configuration • Adequate legacy systems knowledge

Atthirawong and McCarthy (2001) argued that although the identification of CSFs helps to achieve organisational objectives, each individual manager of an organisation may have a different set of CSFs, while the organisation as a whole may have its own, aggregated set of organisational CSFs.

Relying on a review of the literature concerning ERP implementation, Kuang, Lau and Nah (2001) identified eleven main CSFs for ERP implementation that they felt could provide practical guidelines to organisations in the process of ERP implementation. These eleven CSFs provide a holistic and comprehensive summary of all the relevant issues. Table 4.2 below lists these CSFs.

Table 4.2: CSF for implementation of ERP (Source: Kuang et al., 2001)

	Critical Success Factors
1	ERP teamwork and composition
2	Top management support
3	Business plan and vision
4	Effective communication
5	Project management
6	Appropriate business and legacy systems
7	Project champion
8	Change management programme and culture
9	Business process reengineering and minimum customisation
10	Software development, testing and troubleshooting
11	Monitoring and evaluation of performance

Esteves (2004) concluded that the CSF approach has been established and popularised over the last 30 years by a number of researchers, and today the approach is increasingly used to support IT strategic planning. It is particularly suitable for the analysis of ERP projects because it provides a framework that considers the influence of tactical factors such as technical software configuration and project management variables together with broader strategic influences such as overall implementation strategy.

4.2.6 Status of research on ERP

Two surveys of recent research literature on ERP systems (Botta-Genoulaz and Grabot, 2005; Moon, 2007) cited hundreds of articles and analysed the literature according to categories, without any reference to IT Outsourcing. The surveys confirmed that research on ERP systems is still a growing field, but has reached some maturity with growing interest in the post-implementation phase of the projects, customisation and the interoperability of ERP with other systems, including consideration of sociological aspects of the implementation (Soh and Sia, 2004), and the return on investment (Kim et al., 2005).

4.3 Summary

Based on a review of the relevant literature, this chapter described and discussed the shift from IT legacy systems to ERP, explaining the concept of the CSF and the role of CSFs in the evaluation of ERP implementation success. The next chapter will discuss further strategies to measure the success of ERP and also strategies used to measure the success of IT Outsourcing.

Chapter 5: Measuring Success in the context of IT

Following the description of IT Outsourcing and the ERP phenomena with all their implications in Chapters 3 and 4, this chapter investigates different models for the measurement of success in the context of IT, relating specifically to the assessment of ERP systems and IT Outsourcing. I chose to survey the literature relating to this issue as it is pertinent to the research topic: the use of IT Outsourcing for the implementation and maintenance of ERP systems in Israel. Measuring the success of IT Outsourcing involves the identification of factors that determine the success of the organisation's IT systems, factors that can be derived from the organisation's vision and goals, i.e. by comparing expectations to actual achievements.

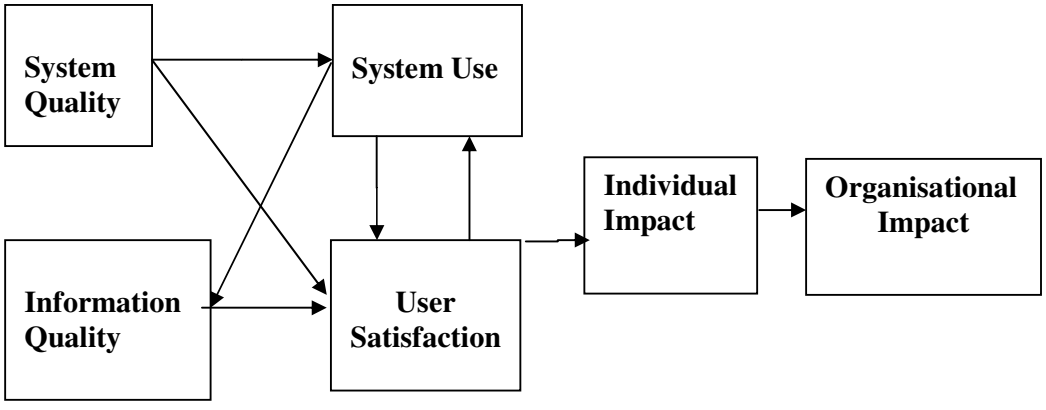
5.1 IT success measurement

According to Petter, Delone and McClean et al. (2008), the IT systems field needs a consistent success measurement tool that would consider the influence of indirect factors such as human, organisational, and environmental factors and enable results from different studies to be compared. Yet, the scope of, and approaches to IT evaluation studies has varied much, and there is little consensus on appropriate measures of IT success (Sabherwal, Jeyaraj and Chowa, 2006). IT evaluation studies have used both subjective and objective measures and have employed a diversity of methodologies such as case studies and surveys. This section traces the development of measurement tools in this field, and establishes the basis for the use of particular tools in this research.

The first comprehensive, multidimensional model of IT success in the organisational context was constructed by DeLone and McLean (1992). The original model was drafted to synthesise existing individual measures into a single coherent model. Relying on a synthesis of data derived from a review of the relevant literature, they developed an *IT System Success Model* (see Figure 5.1), which indicated that IT system success should be assessed through the measurement of the following six dimensions, considered to be interrelated rather than independent (Bernroider, Sudzina, and Pucihar, 2009):

1. System quality – the desirable characteristics of an IT system such as: ease of use, system flexibility, system reliability, ease of learning, including system features of 'intuitiveness' (adaptable without needing much instruction for the user), sophistication, flexibility, and response times. This dimension indicates how the information systems in the organisation are built, maintained and function,
2. Information quality - desirable characteristics of the system's outputs; whether management reports such as web pages are relevant, understandable, accurate, concise, complete, and easily usable. Indicates the quality of the information resources.
3. System use - the level and manner of system usage by the staff and customers including amount of use, frequency of use, nature of use, appropriateness of use, extent of use, and purpose of use .
4. User satisfaction - users' level of satisfaction with reports, Web sites, other outputs and support services.
5. Individual Impact - measure of the effect of information on the recipient
6. Organisational Impact - measure of the effect of information on organisational performance.

Figure 5.1: Information systems success model of Delone and McLean (1992)



The first two dimensions, system quality and information quality, represent the issue of quality that in turn affects the other two dimensions: system use and user satisfaction regarding the IT system. The model posits that user satisfaction leads to increased use of an IT system. Similarly, positive experience with use leads to greater user satisfaction so that these two dimensions 'use' and 'user satisfaction' are closely interrelated. This interaction impacts on individual members of the organisation and eventually engenders a positive or negative effect on the organisation itself (DeLone et al. 1992).

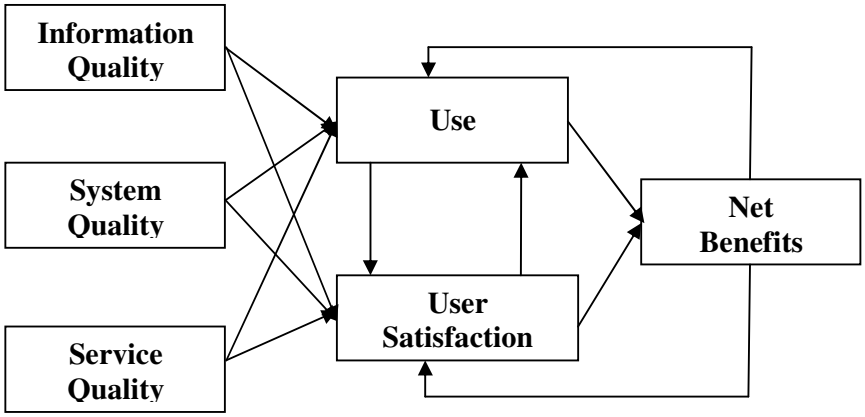
Ballantine et al. (1996) and Seddon (1997) highlighted several important contributions of DeLone and McLean's model: it consolidates previous research, it provides a scheme for classifying the different measures of IT system success that have been proposed in the literature into six dimensions, it suggests a model of temporal and causal interdependencies between the identified categories, it helps to identify different stakeholder groups involved the process, and it provides an appropriate base for further empirical and theoretical research. An indication of its importance is that the model has been generally accepted in the IT community as a valid model for measurement of success in the IT field (Delone and McClean, 2003; Petter et al., 2008). Motivated by DeLone and McLean's call for further development and validation of their model, many researchers have also attempted to extend or re-specify the original model (Urbach and Müller, 2012).

However, Myers et al. (1996) argued that another dimension should be considered, in addition to individual and organisational impact, since any IT system success model should incorporate workgroup impact, as projects are usually a team effort. Indeed, ten years after the publication of their first model and based on the evaluation of the many contributions to it, DeLone and McLean (2003) proposed an updated *IT System Success Model* with additional dimensions: 'service quality' and 'net benefits' (see Figure 5.2 below). Service quality is defined by DeLone and McLean (2003) as the overall support delivered by the service provider, regardless of whether such support is handled by the IT department, a new organisational unit or outsourced provider.

The other dimension proposed by DeLone and McLean (2003), is the 'net benefits' dimension measures the positive effects of the information system according to a pre-defined context in which these benefits will occur. As a result of 'use' and 'user

satisfaction', certain 'net benefits' will occur. 'Net benefits' measure the extent to which IT systems contribute to the success of individuals, groups, organisations, and industries, and includes the two previously defined dimensions of individual impact and organisational impact (for example: improved decision-making, improved productivity, increased sales, cost reductions, improved profits, market efficiency, and economic development).

Figure 5.2: Updated information systems success model of DeLone and McLean (2003)



The feedback loops that appear in Figure 5.2 above represent the assumption that positive experience with 'use' will lead to greater 'user satisfaction'. Similarly, increased 'user satisfaction' will lead to increased use. As a result of 'use' and 'user satisfaction', certain net benefits will occur, which in turn influence and reinforce subsequent 'use' and 'user satisfaction'. These feedback loops are still valid, even if the 'net benefits' are negative, for example: the lack of positive benefits is likely to lead to decreased use and possible discontinuance of the system or of the IT department itself (e.g., wholesale outsourcing).

The DeLone and McLean model (2003) has provided guidance to further research, such as the studies by Iivari (2005) and Sabherwal et al. (2006) who have tested the model's relationships and proposed modifications and extensions. Their results show that perceived system quality and perceived information quality are significant predictors of 'user satisfaction' with the system, but not of system use. 'User

satisfaction' was found to be a strong predictor of individual impact, whereas the influence of system use on individual impact was insignificant (Iivari, 2005).

In another similar model, Sabherwal et al. (2006) included other related parameters to explain interrelationships among four constructs representing the success of a specific IT system (user satisfaction, system use, perceived usefulness, and system quality), and the relationships of these IT system success constructs with three user-related constructs (user experience with user training IT systems, user attitude toward IT systems, and user participation in the development of the specific IT systems) and two constructs representing the context (top-management support for IT systems and facilitating conditions for IT systems). This model is the main representative of the user satisfaction approach (Wixom et al., 2005).

In general, factors for IT success have been investigated in two main research streams: 'user acceptance' and 'user satisfaction' (Wixom et al. 2005). While the Delone and McLean model represents the 'user satisfaction approach, the 'user acceptance' stream is represented by Technology Acceptance Model (TAM),

The TAM model was introduced by Davis (1989). It posits 'user acceptance' as the main variable in the model. However, acceptance is not equivalent to success (Petter et al., 2008). One of the main criticisms of TAM is its limitation in terms of using only the 'user acceptance' dimension as a measure of success. For example, in a case of a mandatory system 'user acceptance' cannot constitute an appropriate measure of IT systems success. In terms of ERP systems, mandatory use is common. Once an ERP system is implemented in an organisation the employees are often required to use the system, regardless of whether they accept the systems or not, so that 'user acceptance' does not provide relevant information concerning the ability of the organisation to ensure success of the system. Therefore, this research adopted the 'user satisfaction' approach for its conceptual framework.

5.1.1 IT Outsourcing success measurement

Relying on their comprehensive review of the literature, Hui and Beath (2002) contended that there is no generally accepted success construct in the IT Outsourcing field. Kim and Chung (2003) also comment that with regard to IT Outsourcing, there seems to be no consensus on what success is and how to measure it. However, the clear definitions of IT Outsourcing success offered by some authors seem to indicate

that there may be ways to achieve uniformity of measurement. Lee and Kim (2003) defined IT Outsourcing success as *"the level of fitness between the service receiver requirements and outsourcing outcomes delivered by the service provider"*. They also supported the suggestion of Lacity and Willcocks (2001) that outsourcing is successful when "*the outcome of IT Outsourcing decisions meets expectations*". This view is analogous to the suggestion of Misra (2004) that success means that both the outsourcer organisation and the service provider achieve their objectives.

In order to evaluate outsourcing strategies, a set of outsourcing success measures is needed enabling an outsourcing strategy to be described and assessed, and making it possible to compare different outsourcing strategies. Grover, Cheon and Teng (1996) developed an instrument to measure IT Outsourcing success based on the results of a survey among top IT executives in 188 organisations in the USA. Their instrument contains nine items classified into three categories: strategic benefits, economic benefits, and technological benefits. Rouse, Corbitt and Aubert (2001) tested the instrument of Grove et al. (1996) with the help of covariance structure modelling and confirmatory factor analysis which indicated that outsourcing success is multidimensional. They defined the success that outsourcing could potentially produce as: satisfaction with benefits from outsourcing gained by an organisation as a result of deploying an outsourcing strategy and produced a revised structural model where outsourcing satisfaction was achieved with service and strategic benefits. They measured service benefit with two items: 'access to skilled personnel' and 'cost reduction', including items relating to 'technological advantages', 'economies of scale', and 'cost reduction' in order to measure strategic benefits.

The following are the nine integrated elements of their instrument according to these three types of benefits and the additional element of overall satisfaction:

1) Strategic benefits:

1.1) The ability of an organisation to refocus on core business and outsource routine IT activities, so that the organisation can focus on strategic uses of IT

1.2) Enhance the IT competence and expertise through contractual arrangements with an outsourcer.

2) Economic benefits:

2.1) The ability to enhance economies of scale in human resources.

2.2) The ability to increase access to skilled personnel.

2.3) The ability to enhance economies of scale in technological resources.

2.4) The ability to increase control of IT expenses.

3) Technological benefits:

3.1) The ability to gain access to important information technologies.

3.2) The ability to reduce the risk of technological obsolescence

4) Overall satisfaction.

4.1) The satisfaction with the overall benefits

This multi-dimensional instrument was tested in the IT Outsourcing field in research such as the study by Seddon and Kiew (1996), who were the first to publish an empirical test of a slightly modified version of the four dimensions of the model and the relationships between them. The results of their study also provided support for elements of DeLone and McLean's model, since it shares common properties with the model of Grover et al. Another study by Rouse et al., (2001) validated the dimensionality and composition of the IT Outsourcing success scale of Grover et al. and verified that IT Outsourcing success is indeed, a multidimensional phenomenon.

Rouse et al. (ibid) criticised the model of Grover et al. (1996) that concentrated on only two of the input/output dimensions of the DeLone and McLean (1992) IT Systems Success Model: system quality and organisational impact. They argued that despite the fact that IT Outsourcing success is considered in terms of service and cost reduction by many researchers, neither cost nor service elements were measured directly in the IT Outsourcing success scale. The economic measure: 'control of expenses' included by Grover et al, (1996) is related to, but not the same as, 'cost reductions'. Rouse et al. (2001) therefore proposed a more detailed item list for measures of cost reduction and service quality factors in order to create a richer and more representative measure of IT Outsourcing success as presented in Table 5.1 below:

Table 5.1: Item list for IT Outsourcing success measures
source: Rouse, Corbitt and Aubert (2001)

No.	Item Description	Service oriented
1	Obtained better service.	Yes
2	Improved flexibility for the business.	
3	Better match resource supply.	Yes
4	Access to better/more skills/expertise.	Yes
5	Enhanced management control.	
6	Access to better/more technology.	Yes
7	Better use of in-house personnel.	Yes
8	Access to services unavailable in-house.	Yes
9	Concentration on core business.	
10	More flexible work practices.	
11	Reduced cost.	
12	Improved cash flow.	
13	Reduced staff numbers.	
14	Rationalised assets	
15	Shift from capital to operating expense.	
16	Changed users' accountabilities.	
17	Have penalties for non-performance.	
18	Industry or economic development.	

The study by Rouse et al. (ibid) indicated that in addition to the items in the original IT Outsourcing success instrument developed by Grover et al. (1996), satisfaction is a function of both service and, indirectly, cost reduction. Their findings support the idea that the three types of IT Outsourcing success benefits of the Grover et al (1996) model, contribute significantly to IT Outsourcing satisfaction, and that 'strategic benefits' are the most important.

Dahlberg and Nyrhinen (2006) designed a completely new instrument for measuring outsourcing success and verified it in five cases. They included more detailed measurement items and added an additional fourth category called social factors. This category also considers 'user satisfaction'.

All three instruments use Likert scales to measure to what extent outsourcing drivers or benefits have actually been achieved in practice. Grover et al. (1996) and Dahlberg and Nyhrinen (2006) used 7-point scales while Rouse et al. (2001) used a combination of 7-point and 4-point scales. None of the authors included definitions of their outsourcing success measures. Sample items in these measures included: "we have been able to refocus on core business" (Grover et al., 1996), "obtained better service" (Rouse et al., 2001), and "we have achieved the objective of reducing IT expenditure very well" (Dahlberg and Nyhrinen, 2006; Schoeman et al., 2008).

Other factors that influence the IT Outsourcing-organisation relationship have been considered for the measurement of success of outsourcing ventures. Dibbern et al. (2004) claimed that IT Outsourcing is such a complex phenomenon that the context plays a much more significant role in IT Outsourcing than in other areas of IT success measurement. Lee and Kim's (1999) study of seventy four outsourcing relationships supported this view (in the USA), identifying partnership quality as a significant driver of IT Outsourcing success. They indicated that cultural similarity between the partners of the outsourcing arrangements is a significant correlate to partnership quality. This concept was amplified by Westrup and Knight (2000) and Kirsch and King (2005) who noted that good relationships between the ERP vendor/consultant and the adopting organisation enhance the transfer of relevant information and knowledge to the organisation Kim and Chung (2003) who used relational exchange theory to develop and test a model of outsourcing success, concluded that using a vendor governance structure that emphasises a cooperative long-term focus leads to an increase in outsourcing success.

As noted above DeLone and McLean acknowledged this complexity and eventually added the dimensions of 'service quality' and 'net benefit' to their model. Gefen (2000), suggested that with the growing popularity of IT Outsourcing, 'service quality' often involves an external provider and its responsiveness affects how 'cooperative' that vendor is perceived to be.

Lee and Kim (2003) asserted that the updated DeLone and McLean model is relevant for and facilitates evaluation of IT Outsourcing success, since it emphasises the need to assess the quality of offered services as organisations pursue outsourcing for higher quality services. However, Petter et al. (2008) argued that the application of the DeLone and McLean (2003) model, even in its enhanced form depends on the

organisational context; meaning that the measure of an organisation's success will vary in all the assessed dimensions according to the type of organisation and the type of IT systems that it employs.

Lee et al. (2004), who also used the multi-item outsourcing success instrument of Grover et al. (1996) to measure IT Outsourcing success, claimed that "*as outsourcing grows in complexity, researchers need to develop more sophisticated metrics to assess the success of outsourcing ventures"* (p.127). They suggested the inclusion of a social perspective in order to explain reciprocal relationships between IT Outsourcing service providers and the outsourcer organisations, a perspective ignored in the instrument of Grover et al. (1996).

Dahlberg and Nyrhinen (2006) also indicated that it was necessary to enlarge the nine-item measuring instrument noting that IT Outsourcing services including ERP expertise evolve and expand continuously, so that the instruments for evaluation of IT Outsourcing success in user organisations should be adjusted accordingly. Expanding the instrument of Grover et al. (1996) they conceptually validated a coherent and updated multi-item survey instrument that adds and combines social success factors to the strategic, economic, and technical views in the original measurement instrument of Grover et al. (1996). They defined the social benefit factor of IT Outsourcing as: "*an organisation's ability to create a working environment which leads to improved motivation and user satisfaction*" (p.5), explaining that social factors include: norms, culture, history, and group differences influencing social interactions (reliability, responsiveness, assurance, empathy). Also expanding on the DeLone and McLean (1992) *IT Systems Success Model*, Dahlberg and Nyrhinen (2006) applied service quality and user satisfaction in their instrument as items of social benefits. The integrated elements of their expanded instrument were classified according to the following four types of factors:

1) Strategic factors

1.1) To increase concentration on core business.

1.2) To improve the capability of IT to support the needs of business operations.

1.3) To improve the management of technology and human resources.

1.4) To increase the number of IT based innovations.

1.5) To reduce the number of IT staff.

2) Economic factors

2.1) To reduce IT expenditure.

2.2) To improve financial freedom and flexibility (releasing capital, flexibility in budgeting and investments).

2.3) To improve control over IT expenditure.

3) Technological factors

3.1) To ensure the availability of necessary or new technology.

3.2) To ensure the availability of necessary or new IT skills.

3.3) A standardised IT environment (hardware, software, processes).

3.4) A well-functioning IT environment.

4) Social factors

4.1) To improve the quality of services (a safe, reliable service corresponding to our needs, capable of adapting to individual requirements).

4.2) To improve the availability of services (e.g. more services).

4.3) To improve user satisfaction.

Each element in the proposed instrument is measured according to two criteria:

1. The extent to which a particular item was important as an objective for IT Outsourcing.
2. The extent to which that objective was achieved.

In addition, the overall satisfaction of the organisation is measured as in the model of Grover et al. (1996). This model of Dahlberg and Nyrhinen (2006) asks respondents to grade their attitudes concerning statements relating to each item on a 7-point Likert scale (on an attitude continuum running from 7= 'strongly agree' to 1= 'strongly disagree'). This scale allows greater sensitivity for differences since similar scales have more usually employed a 5-point Likert scale (Oppenheim, 1992). The instrument of Dahlberg and Nyrhinen (ibid) was also useful because it allowed evaluators to explore differences between outsourcing targets in separate organisations, and the differences between objectives and achievements which may point up items for management consideration.

More recent research by Cullen, Seddon, and Willcocks (2008), indicated that IT Outsourcing success should be evaluated in terms of the achievement of the organisation's own goals, and not the achievement of all possible goals. They described the instrument developed by Grover et al. (1996) as *"the best instrument*

currently available for measuring IT Outsourcing success" (Cullen et al., 2008, p.4), and tried to improve on the model by creating a new measurement instrument. Like Grover et al. (1996) and Dahlberg and Nyrhinen (2006), they argued that satisfaction is a valid perceptual measure of IT Outsourcing success, because it draws on the respondent's goals. But Cullen et al. (2008) also criticised the nine-item model of Grover et al. (1996), as (a) it assumes that its nine items are always applicable in all situations to all respondents, and (b) it does not ask about outcomes such as obtaining value for money, cost savings, and improved service quality. Cullen et al. (2008) concluded that (a) further work is required to refine the IT Outsourcing success construct, (b) what constitutes IT Outsourcing success may differ from organisation to organisation, and (c) organisational goals for IT Outsourcing change over time. Although management may start out with quite ambitious goals, after they encounter problems, they may focus on some more targeted, but more achievable goals for their IT Outsourcing project.

5.1.2 Measuring the success of ERP systems

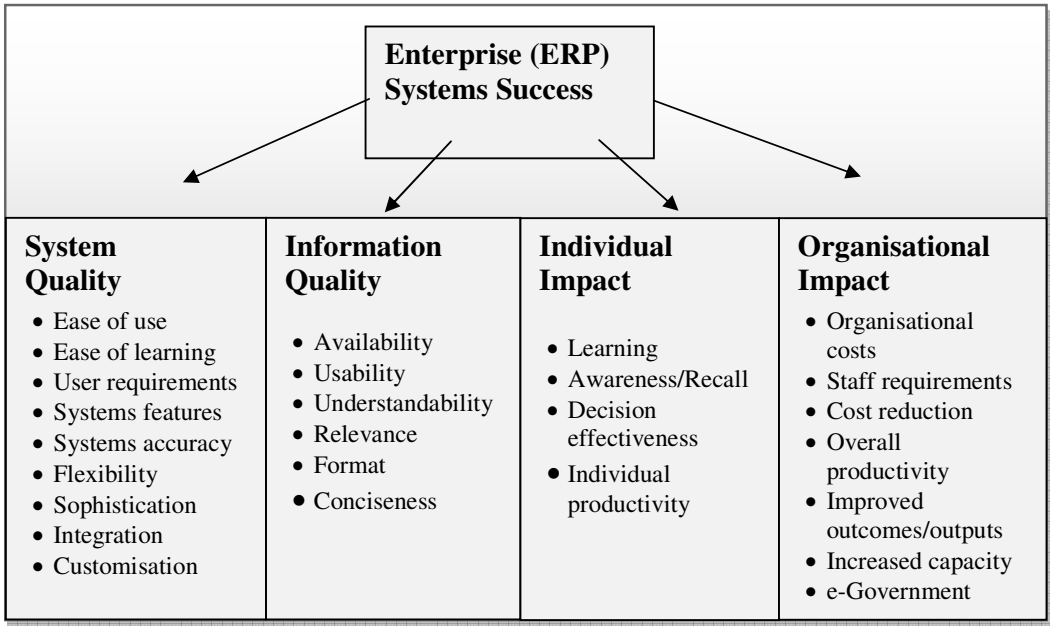
As noted in Chapter 4, ERP is a system which has some specific characteristics which differ from other IT systems such as Legacy systems. ERP hold the promise of improving business processes and decreasing costs (Nah, Lau and Kuang, 2001; Beheshti 2006), as ERP systems facilitate communication and coordination, centralise administrative activities, increase ability to deploy new information system functionality and reduce information system maintenance costs (Siau, 2004). Successful ERP system implementation is a crucial step for any enterprise since it affects the whole organisation. This calls for the identification of a unique set of success factors in order to measure ERP systems (Tan et al. 2002). In comparison to other areas of ERP related research, e.g. ERP implementation, the aspect of ERP success assessment has received comparatively less attention in the literature. Because of the lack of knowledge, organisations adopting ERP systems usually do not know how to properly assess or evaluate the ERP system's success (Ifinedo 2006).

The models developed to measure IT systems success in a traditional IT context are not entirely appropriate for measuring ERP success (Gable, Sedera and Chan, 2003), necessitating a rigorous and comprehensive approach in order to adapt existing models to create an appropriate measuring instrument. This challenge was met by

Gable et al. (2003). Building upon the DeLone and McLean (1992) *IT Systems Measuring Model*, and a measurement assessment framework created by Myers et al. (1997), Gable et al. (2003), developed a specific multidimensional success measurement instrument for the ERP context.

In order to meet ERP characteristics Gable et al. (2003), revised the identified success dimensions and measures in the original *IT Systems Measuring Model* by omitting several measures. The 'use' construct was omitted from the model because ERP systems are usually mandatory services in an organisation, and the extent of use does not provide much information about the success of the system. Also, measures which most often overlap with other similar ones were omitted. Conversely, 'customisation' has been identified and included as an important measure of system quality. A more holistic 'organisational impact' measure was also developed. Specifically, ERP-related measures of 'organisational impact' have been incorporated such as: cost reduction, increased capacity, business process change, staff requirements, and e-governance readiness. The final validated model includes 27 measures divided according to four dimensions: (1) 'information quality', (2) 'system quality', (3)'individual impact', and (4) 'organisational impact' which are graded by respondents on a 7- point Likert scale (see Figure 5.3 below). The model does not propose any causality effects between the dimensions.

Figure 5.3: ERP Systems Success Measurement Model of Gable et al. (2003)
(Adapted from Sedera et al., 2004)

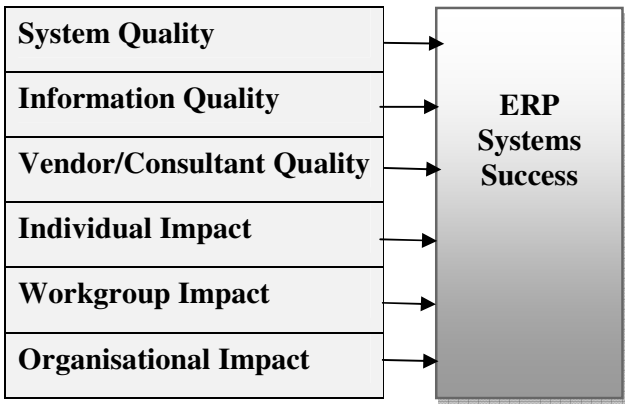


This model has been further validated by Sedera et al. (2004) and the results confirmed strong model relevance.

According to Ifinedo (2006), ERP success assessment is challenging because of its complex nature. Based on a literature review, Ifinedo (2006) suggested the incorporation of two more dimensions into the ERP success model: 'vendor/consultant quality' and 'workgroup impact'. Hence, Ifinedo's model of ERP systems success measurement involves six dimensions (see Figure 5.4 below).

1. *System Quality* considers questions such as "Our ERP is easy to use" and "Our ERP is reliable."
2. *Information Quality* asks if "The information on our ERP is understandable" and if "The information on our ERP is relevant."
3. *Vendor/Consultant Quality* asks whether "Our ERP vendor/consultant is credible and Trustworthy" and if "Our ERP vendor/consultant has good relationships with my organisation"
4. *Individual Impact* questions whether "Our ERP improves individual productivity", and whether "Our ERP is beneficial for individual's tasks."
5. *Workgroup Impact* questions whether "Our ERP helps to improve workers' participation in the organisation."
6. *Organisational Impact* inquires whether "Our ERP reduces organisational costs." and whether "Our ERP increases customer service/satisfaction."

Figure 5.4: The Extended ERP Systems Success Measurement Model of Ifinedo (2006)



Ifinedo (2006) explained that he had constructed the model on both subjective and perceptual measures because according to Mabert, Soni and Venkatraman (2003) objective measures are difficult to quantify and obtain from organisations. The 'workgroup impact' dimension was added to reflect the validation of the contributions made by work teams toward organisational productivity by Myers et al. (1996). Both vendors and consultants were grouped together in the model developed by Ifinedo in 2006, because they represent sources of expertise from outside the organisation that deal with ERP implementation, and in some instances an organisation may deal with one entity representing both these roles (Poston and Grabski, 2001).

Another study by Chien and Tsaur (2007) found that 'net benefits' (mentioned in the DeLone and McLean model) are the most important success measures as they capture the balance of positive and negative impacts of the ERP system on organisations. Positive net benefits may encourage the motivation to use the ERP system and increase user satisfaction, while negative net benefits can decrease motivation to use and IT systems user satisfaction.

5.2 Summary

This chapter discussed the evolvement of success dimensions for the measurement of success of IT Outsourcing and ERP systems, showing the way in which increasing dimensions have been included in measurement models as the IT field develops. The next chapter shows how the theoretical concepts discussed in Chapters 2-5 interact to form the conceptual framework within which the research was situated.

Section 3: Conceptual Framework and Research Questions

Preview

This third section of the thesis describes the conceptual framework of the research, containing the theoretical concepts derived from the literature review on which the research was grounded. Each component of this synthesis of the theoretical concepts is presented separately, yet the interplay between the theories is noted. The section concludes by presenting the gap discovered in extant knowledge in this field and then reiterates the research questions that guided me to contribute to filling this gap.

Chapter 6: The Conceptual Framework of This Research

This chapter discusses the conceptual framework upon which the research is based. It describes the gap in knowledge that was discovered as a result of the review of the relevant literature and then defines the questions that consequently drove the research in order to contribute to filling this gap.

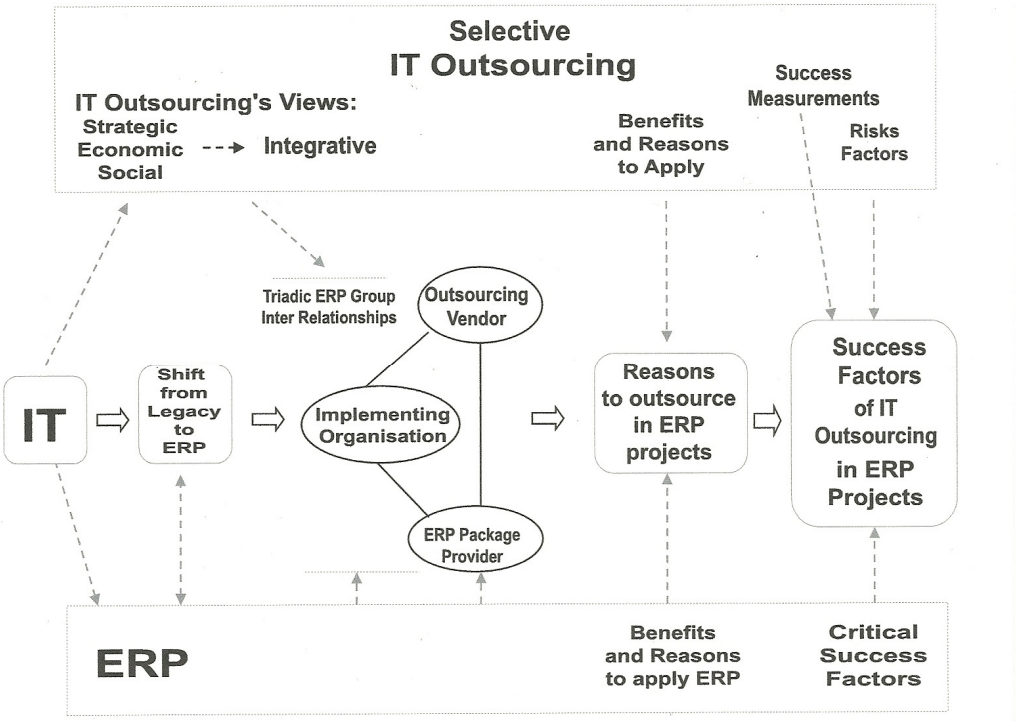
6.1 The components of the conceptual framework and their interrelations

Pertinent concepts and theories were drawn from the review of the relevant literature to form the study's conceptual framework. According to Leshem and Trafford (2007, p. 99)

> *Most authors use the term* [conceptual framework] *to describe a specific function and set of relationships within the research process. This approach locates the conceptual framework as fulfilling an integrating function between theories that offer explanations of the issues under investigation.Conceptual frameworks also provide a scaffold within which strategies for the research design can be determined, and fieldwork can be undertaken.*

The concepts and theories included in the conceptual framework assisted the process of reasoning necessary for the formation of the research questions which would guide the quest to achieve the study's objectives. Figure 6.1 below provides an illustration of the conceptual framework.

Figure 6.1: The conceptual framework



The constituent theories of the framework in Figure 6.1 above are now summarised according to the issues to which they relate:

6.1.1 IT Outsourcing

The concept of IT was chosen as the starting point for the conceptual framework since it constitutes the basic hub to which all the other components are connected. The term IT refers to an organisation's entire computing systems and this constituted the field where the research was conducted.

As IT tools and methods have developed to become an essential feature of any organisation's successful performance, IT Outsourcing has increasingly been accepted as a basic strategy, to help organisations to meet this need (Akomode, Lees and Irgens, 1998). IT Outsourcing appears in the literature within a distinct area of knowledge known as Information System Management Issues (Barki, Rivart and Talbot, 1993).

Millar (1994) defined three general alternative types of IT Outsourcing arrangements:

1. *Selective Outsourcing* - where one particular area of IT activity is chosen to be turned over to a third party,
2. *Value-Added Outsourcing* - where some area of IT activity is turned over to a third party in order to provide a level of support or service which adds value to the activity that could not be cost effectively provided by the internal IT department in the organisation, and
3. *Cooperative Outsourcing* - where some targeted IT activities are jointly performed by a third party provider and the internal IT department.

This research focused on selective IT Outsourcing where the vendor supports modules and sub-systems development, as opposed to allowing the outsourcing vendor to take charge of the whole organisation's IT development and on-going IT operations.

As noted in the previous chapter, IT Outsourcing is conceptualised according to three main viewpoints: strategic, economic and social, and there have been attempts to construct an integrative view which would combine consideration of all three viewpoints. Other aspects of IT Outsourcing considered by the literature are the motivations for employing outsourcing, success measurements models, and IT Outsourcing's potential benefits and risks. All these aspects were considered relevant for the research and depicted in the upper part of the conceptual framework scheme depicted in Figure 6.1 (above). The arrows depicted in the scheme indicate the direction of interrelations between the different components. Other aspects of IT Outsourcing that help to explain the studied phenomena and provided a basis for the research investigation include: IT Outsourcing arrangements, the degree of IT Outsourcing (total, selective, and none); the mode of IT Outsourcing (single vendor or multiple vendors), and the time frame of the IT application (short term or long term).

6.1.2 From Legacy Systems to ERP Systems

Usually, over the years, the organisation's IT systems have evolved through different types of information systems from in-house developments and legacy systems to ERP systems. The ERP system helps the organisation to integrate its various functions, by establishing and maintaining a common database, and generates high-level managerial reports that aid decision-making (Zheng and Tam, 2000), replacing

the old legacy systems in the organisation in order to achieve better performance and competitiveness. The success of these processes has led to a general shift from legacy systems to ERP. The prevalence of ERP systems in organisations in almost every field is affirmed by many sources in the relevant literature (Markus, Axline, Petrie and Tanis, 2000; Davenport and Brooks, 2004; Buonanno et al., 2005).

The phenomenon of ERP is represented in Figure 6.1 (above), in the lower part of the conceptual framework scheme including the reasons for the application of the system, the benefits that it offers, and the critical success factors for ERP. All these elements need to be considered to measure the effectiveness of the ERP system. The selection of the appropriate ERP system is one of the most important steps in an ERP implementation (Nah and Delgado, 2006). Another essential part of the ERP implementation process is the selection of the vendor who will supply the ERP system.

IT service providers and the ERP community are represented in the centre of Figure 6.1 (see above) by the triadic ERP group: the outsourcing vendor including ERP consultants, the implementing organisation, and the ERP package provider and the interrelations between them. (See Appendix 6.1 - The overall role of the ERP community players). This triad constitutes the primary component that represents the correlation between both phenomena: IT Outsourcing and ERP.

6.1.3 Success Factors

Essential to my research framework is the integration of matching concepts, which were viewed and researched separately for each of the two studied phenomena: IT Outsourcing and ERP. The most pertinent of these concepts for the research issue are of course the success factors and the risk factors for failure.

All the other above-mentioned related components enabled me to identify and to understand these success factors. The risks of general IT Outsourcing, and the critical success factors for ERP influence the success factors for IT Outsourcing in ERP projects directly. These processes are represented in Figure 6.1 above by the arrows leading to the IT Outsourcing success factors.

Success factors are factors which influence outcomes; Critical Success Factors (CSF) constitute a particular subset of success factors. The word 'critical' is employed here since these factors are so important that they do not simply contribute to success or

failure but may make the difference between success and failure. If one of these factors is absent, or less than optimal, then the operation will be directly and adversely affected. They identify and state the most important elements required for the success of an organisation's operations (Hossain and Shakir, 2001a). Critical success factors relating to vendors include vendors' skills and knowledge of their system, their understanding of the requirements, constraints and concerns of the organisation and its industry, vendors' longevity and ability to meet future needs, and to support and assist the implementation process (Verville and Halingten, 2003).

Success measurements models such as those of Grover, Cheon and Teng (1996) and DeLone and McLean (2003) suggest identified success factors that can be employed to measure the success of IT Outsourcing in ERP projects.

The above-mentioned components and the relations between them together form the conceptual framework of this research. Like other such frameworks, this conceptual framework is designed to describe the structure of a set of objects within a given domain, and the relationships among those objects (Mitroff, 1983); the domain studied by this research being the Israeli IT field.

6.2 Identification of the gap in knowledge

Despite the paramount significance of both the IT Outsourcing phenomenon and ERP (as cited above) for the successful functioning of an organisation, most extant research of IT Outsourcing has targeted outsourcing in the context of traditional IT systems. The surveys by Botta-Genoulaz and Grabot (2005) and Moon (2007), cited above in chapter 2, specifically addressed ERP and did not mention IT Outsourcing. In another survey on ERP systems, outsourcing services are mentioned as open issues (among many others) under "Topics for Further Research" (Esteves and Bohorques, 2007). A survey on IT Outsourcing entitled "Information Systems Outsourcing: A Survey and Analysis of the Literature" (Dibbern et al., 2004), comprising 100 pages of literature review, shows that the literature provides ample knowledge about IT Outsourcing, and issues related to it but most of the articles and theories and research in this field lack any special reference to ERP. This comprehensive survey of IT Outsourcing academic literature, indicated that the reviewed articles discuss the questions of why, what and how to outsource, and what are the outcomes. However, the review does not categorise the types of IT systems

nor does it differentiate between traditional IT systems and ERP cross-organisational package-based systems.

Additionally, the literature relates to the phenomenon of IT Outsourcing worldwide, but little research has related specifically to the Israeli context. In Israel, Morad (2003) investigated IT Outsourcing, but concentrated on the issue of senior management's expectations, views and intentions when making the decision to employ outsourcing. As far as I could discover from a thorough search of the relevant sources, the most profound work to date on IT Outsourcing in Israel relates solely to the difference between two models of accomplishing the work and payment for the projects in IT Outsourcing contracts (Ariav and Lichtenstein, 2007).

The present study therefore attempts to fill this gap in knowledge by providing additional knowledge concerning the reasons for IT Outsourcing, specifically in the Israeli context, and by identifying factors important for the successful employment of outsourcing in ERP projects.

This section explained the conceptual framework that would guide the investigative work of the research and identified the gap in knowledge which the research sought to clarify. On the basis of this conceptual framework, the following questions were constructed to attain the research objectives.

6.3 The research questions

The research aimed to investigate the reasons for IT Outsourcing and the most influential success factors for IT selective outsourcing within ERP projects in Israel. To gain the necessary background understanding for this study, I gleaned extant theoretical and research material from the relevant literature in order to construct the above-mentioned conceptual framework that would elucidate: (1) The reasons for IT Outsourcing in ERP projects in Israel. (2) How and to what extent does the use of IT Outsourcing within ERP projects, differ from outsourcing in traditional software projects?

These queries underpinned the formation of the following research questions:

1. What are the reasons for IT Outsourcing in ERP projects in Israel?
2. How and to what extent does the use of IT Outsourcing within ERP projects, differ from outsourcing in traditional software projects?
3. The main research question: What are the success factors for selective IT Outsourcing within ERP projects in Israel?

6.4 Summary

This chapter introduced the conceptual framework that emerged from knowledge derived from the literature review. This knowledge was synthesised, indicating the logic and the flow of the reciprocal relations between the different components, and helped to define the potential outputs of the study towards the definition of the research questions. The next section details the chosen research methodology, exploring ways to find the answers to the research questions.

Section 4: Research Methodology and Design

Preview

The fourth section of this thesis describes available methodologies that could help me to gather appropriate data to answer the research questions. It traces the considerations that led to the choice of research approach and methodology that finally shaped the research design adopted for this study

Chapter 7 - Choosing the Research Approach and Methodology

In line with the supporting conceptual framework, various research approaches were considered to find an appropriate methodology for the field work that could produce relevant data to answer the research questions.

7.1 Identifying the research field: The source of knowledge

This is an exploratory study, because as far as can be ascertained, no known research has been conducted about the interlacing of IT Outsourcing with ERP and this seems to be the first study relating to these issues in the Israeli context.

Israeli organisations that employ IT Outsourcing for the implementation and maintenance of ERP systems were chosen as the relevant research field. It was felt that IT managers and team leaders of IT departments would constitute the suitable research population, since they have direct experience regarding all the issues under study. Their perceptions, attitudes, and beliefs would potentially provide a broad picture of the employment of IT Outsourcing in ERP projects in Israel, and based on their experience, they could indicate what they felt to be the relevant success factors. The guiding assumption here was that all cases of ERP IT Outsourcing processes are basically similar, regardless of the different areas of business of the different organisations in Israel who used these ERP systems. The selection of the organisations was guided by their scale, and the maturity of the ERP systems implementation process, using IT Outsourcing. Organisations were also chosen because they represented various industrial categories.

7.2 Research paradigm and methodology: Positivist or post-positivist approaches

Research is essentially a search for 'truth' - but often 'the truth' depends on how an individual looks at things. These different perceptions of the world are known as 'paradigms'. They represent different schools of thought, or frameworks of beliefs, values and methods that guide the researcher to discover 'the truth'. Denzin and Lincoln (2003) and Collis and Hussey (2003), explained the distinction between two main research paradigms: positivist and post-positivist. They indicated that the positivist paradigm is concerned with testing hypotheses, it utilises large samples,

data are exceedingly particular and precise, and it produces quantitative data. Philosophically, quantitative researchers begin from the perspective that events can be understood in terms of cause and effect (Burns and Grove, 2005). This traditional research paradigm relies on numerical (i.e. quantitative) data and mathematical or statistical treatment of those data. It is based on accurate measurement of an objective reality (Cresswell, 1994). The 'truth' that is uncovered is thus grounded in mathematical logic. This traditional research paradigm produces what is considered as highly reliable research, One possible disadvantage of the traditional research paradigm is that it can only be used where the variables that affect the work can be identified, isolated and relatively precisely measured (Bryman and Bell, 2007). Although research set in this research paradigm can answer questions about what is happening and the statistical chances of something happening in the future, it is less likely to directly answer questions about why something is happening nor can it elicit additional information about the existence of anything else that may be relevant to the existence of the phenomenon (Creswell, 1994).

Contrastingly, the post-positivist paradigm is concerned with developing theories, it utilises limited samples, and it produces rich and subjective qualitative data (Collis and Hussey, 2003). Creswell (1998) indicated that qualitative research was most suited to the study of human behaviour because: "*Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The research builds a complex, holistic picture, analyzes words, reports detailed views of informants, and conducted the study in natural setting*." (p. 15)

Gall, Borg, and Gall (1996) defined qualitative research as the "*inquiry that is grounded in the assumption that individuals construct social reality in the form of meanings and interpretations, and that these constructions tend to be transitory and situational. The dominant methodology is to discover these meanings and interpretations by studying cases intensively in natural settings and subjecting the resulting data to analytical induction*."

Creswell (1998) indicated that a qualitative study pursues 'what' and 'how' questions to get a deeper understanding of an observed phenomenon, exploring a topic to develop theories. Research set in this research paradigm can address questions about how and why something is happening. It can also address questions about what is

happening in a wider context and what is likely to happen in the future - but it can seldom do so with statistical confidence, because the 'truth' is not grounded in mathematical logic.

Of course, these are broad generalisations. Research doesn't always fall neatly into these categories and Cresswell, (1994), Denzin and Lincoln (2003), and Collis and Hussey (2003) all understand that the simplistic divisions suggested above are exaggerated. Positivist approaches do not rule out deductive reasoning and quantitative methods are often used in essentially qualitative enquiry, as in this research. The labels are widely used however to describe trends or orientations and the term 'mixed methods' as it is used here reflects this convention. In the case of this study there were no hypotheses to test, and there were no predetermined concepts to explore. Rather the research was intended to discover new knowledge without any preconceptions. Thus, the term post-positivist paradigm is appropriate to describe the approach selected as the most suitable for use in this study, enabling me to investigate the phenomenon of IT Outsourcing through the (subjective) perspectives and experiences, of those who practiced and experienced IT Outsourcing in their daily lives, with no hypotheses in mind. A post-positivist approach provided the overall research paradigm, aiming to develop insights and propositions, posing questions, and eliciting people's different perceptions concerning the studied issue (Creswell, 2003).

7.3 Research design: Inductive-naturalistic or deductive

The adoption of a post-positivist approach called for an inductive-naturalistic research design, so that the research would be conducted within the respondents' natural surroundings. An inductive-naturalistic tradition of inquiry allows the researcher to develop a complex picture of the issues as they appear within their natural settings (Bogdan and Biklen, 1998), illuminating the meanings that people bring to these settings (Denzin and Lincoln, 1998).

An 'inductive' research design contrasts with a 'deductive' design. Bryman and Bell (2007), explain that the researcher conducts a process of induction when inferences are drawn from the findings in order to produce theory concerning the studied issue. Contrastingly, in a deductive research design the thinking process runs in a different direction, the researcher deduces a hypothesis (or hypotheses) on the basis of extant

knowledge and theoretical considerations in a particular domain. Then, the hypotheses deduced are subjected to empirical inquiry (Bryman, 2004). In this research, although the study draws on an existing theoretical basis, no hypotheses were predetermined to test. Therefore, a deductive research design was deemed inappropriate here.

One of the methodologies that could be considered for a post-positivist inductive approach is the case study. According to Lacity and Hirschheim (1995), most IT Outsourcing research has involved case studies, suggesting that IT Outsourcing success is multidimensional, and often involves conflicting aspects. But, case study research poses a critical problem to researchers seeking to identify recommended practice as case studies are by nature idiosyncratic, and are not designed to generalise to a larger population (Rouse, Corbitt and Aubert, 2001). For this purpose, more data are needed about the extent to which the cases are characteristic of other organisations in the field and therefore a case study research was not appropriate for use in the present research since more general knowledge was sought concerning the studied issue that would enable the construction of an explanatory model.

7.4 Research approach: Quantitative, qualitative or mixed

The nature and substance of the studied issue should guide the research approach (Silverman, 2000). Whether a quantitative or qualitative approach is appropriate for a particular study also depends on the selected research paradigm, or set of assumptions chosen for the research (Sale et al, 2002; Yauch and Steudel, 2003). Creswell (1994), and Neuman (1997), categorised research approaches as either quantitative: stemming from the 'scientific empirical tradition' or qualitative: stemming from 'naturalistic phenomenological approaches'.

Qualitative research is broadly defined as "*any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification*" (Strauss and Corbin, 1990, p. 17). Qualitative research inevitably involves the researcher's own point of view, which necessarily contains an element of researcher bias. Qualitative researchers participate in the research and take a stand and (whether consciously or unconsciously) they affect the results and interpretations of results with their own attitudes and opinions (Janesick, 2000). Unlike quantitative researchers who seek causal determination, prediction, and generalisation of

findings, qualitative researchers instead seek illumination, understanding, and extrapolation to similar situations (Hoepfl, 1997).

As the aim of the research was to explore and determine the factors which contribute to successful outcomes of selective IT Outsourcing of Israeli organisations within ERP projects, it was felt that the first step should be to gather the information in a qualitative way without any predetermined hypotheses that might limit the issues explored. The research questions were constructed according to the guidelines of the conceptual framework. The nature of the research questions guided the design of an initial qualitative study that would ascertain existing perceptions and issues related to IT Outsourcing by qualitative methods. However, the findings of this qualitative study needed to be tested and measured. In such cases, a complementary quantitative method may be used in order to reinforce the validity of the qualitative findings. This strategy is known as a mixed method approach including the employment of both qualitative and quantitative research methods.

In order to mix research methods in an effective manner, researchers first need to consider all the relevant characteristics of quantitative and qualitative research. For example, the main characteristics of traditional quantitative research are: a focus on deduction, confirmation, theory/hypothesis testing, explanation, prediction, standardised data-collection, and statistical analysis (see Table 1 in Appendix 7.1). The main characteristics of traditional qualitative research are: induction, discovery, exploration, theory/ hypothesis generation, the researcher as the primary 'instrument' of data-collection, and qualitative analysis (see Table 2 in Appendix 7.1).

The mixed-methods methodology was deemed appropriate for the present research, since as Bryman (1992) suggested, a combination of qualitative and quantitative research can produce a much more complete account of social reality.

Social researchers use mixed methods strategies for one or more of the following purposes: improved accuracy, a more complete picture, compensating strengths and weaknesses (by combining multiple observers, theories, methods and data sources, researchers can hope to overcome the intrinsic bias that comes from single-methods, single observer, and single theory studies), and to develop the analysis with one method informing the other (Bryman, 2006; Denscombe, 2007; Denzin, 1989). In other words, a researcher who understands the strengths and weaknesses of

quantitative and qualitative research approaches is in a position to mix or combine strategies and to use the fundamental principle of mixed research (Johnson and Turner, 2003). The collection of multiple data using different strategies, approaches, and methods means that the resulting mixture or combination is likely to result in complementary strengths and no overlapping weaknesses (Brewer and Hunter, 1989) (see Table 3 in Appendix 7.1).

Creswell (2003, pp. 213-220), described six important strategies or ways in which quantitative and qualitative methods can be combined together:

1. *Sequential explanatory strategy* - the collection and analysis of quantitative data in the first stage, followed by the collection and analysis of qualitative data in the second stage. Creswell (2003) indicated that a qualitative method can help to explain unexpected results arising from use of a quantitative method in more detail.

2. *Sequential exploratory strategy*, - the collection and analysis of qualitative data in the first stage, followed by the collection and analysis of quantitative data in the second stage. Creswell (ibid) contended that this strategy can be used to test an instrument or elements of a theory emerging from the qualitative stage, and to generate qualitative findings for different samples.

3. *Sequential transformative strategy*, associated with two distinct data-collection stages, either method may be used first and priority is given to either quantitative or qualitative stages or both.

4. *Concurrent triangulation strategy* uses both qualitative and quantitative methods in an attempt to confirm, cross-validate, or corroborate findings within a single study in order to offset the weaknesses within one method with the strengths of another. The data-collection happens simultaneously, with priority typically given equally to both methods.

5. *Concurrent nested strategy* - the collection of both qualitative and quantitative data simultaneously but giving priority to one method that guides the project, which contains another method nested within.

6. *Concurrent transformative strategy* - the use of the appropriate method which can best facilitate the chosen theoretical perspective, regardless of whether the concurrent model is triangulated or nested; data are typically collected simultaneously and may have equal or unequal priority.

In this research the first objective was to discover potential success factors, by gathering the fullest possible data from qualitative sources and these findings were then tested in a quantitative manner. The sequential exploratory strategy, mentioned by Creswell (2003) above, was therefore the most effective choice for this research. This strategy of mixed methods research is justified here because it can produce a richer output than would mono-method studies. The two methods were employed in two consecutive research stages: Stage One attempted to identify the success factors for effective implementation of selective IT Outsourcing within ERP projects in Israel, as perceived by the respondents, using a qualitative inquiry, and Stage Two tested and measured the significance of those success factors, using a quantitative inquiry.

The research took place in the IT context in Israeli organisations. Previous research such as the work of Kaplan and Duchon (1988), Lee (1991), and Gable (1994) has employed mixed-methods research to investigate particular phenomena in the IT field. Trauth and Jessup (2000) also suggested that researchers should employ mixed quantitative and qualitative research methods to achieve a better understanding of the effects of IT in organisations.

7.5 Research methods and data-collection tools

Having determined that mixed-methods would be employed for the research, it was then possible to choose appropriate data-collection tactics. The quantitative and qualitative methods were interlinked in a complementary manner, and applied in two research stages, one leading to the next, while each stage was tied back to the conceptual framework which provided the theoretical foundation for this study.

Stage One: Semi-structured interviews, Open-ended questionnaire

Stage One was concerned with the identification of success factors for the implementation and maintenance of ERP projects with the assistance of IT Outsourcing. For this purpose semi-structured interviews and an open-ended questionnaire were employed as suggested by Denzin and Lincoln (1998), and also by Bryman and Bell (2007). These methods were also chosen as appropriate qualitative data-collection methods in situations broadly comparable to the selected research field. For example: a study that attempted to identify the antecedents of end-user satisfaction with an Enterprise Resource Planning (ERP) system, used content and thematic analysis of textual answers to the open-ended question of a survey (Roses, 2011); while another study of coordination among ERP consultants used semi-structured interviews as a primary data source, using open, axial and selective coding to analyse the collected data (Chang et al., 2011).

Open-ended questions are questions to which there is not one definite answer**.** Often they are not technically questions, but rather statements, which implicitly ask for responses. Open-ended questions encourage people to talk about whatever is important to them. They help to establish rapport, gather information, and increase understanding. Open-ended questions invite others to 'tell their story' in their own words without leading respondents in a specific direction. The drawback to open-ended questions is that the responses are more difficult to catalogue and interpret. Fink (1995) suggested that open-ended questions should be used frequently, though not exclusively, in a fluid conversation. This type of questions was used both in the semi-structured interview and in the open-ended questionnaire.

Research interviews are defined as *"a two-person conversation initiated by the interviewers for the specific purpose of obtaining research-relevant information, and focus by them on content specified by research objectives of systematic description, prediction, or explanation"* (Cannel and Kahn, 1968, p. 527). This technique allows a researcher to interact with participants, and provides a passageway into participants' thoughts regarding their behaviours, views, attitudes and feelings that cannot be directly observed (Patton, 1990). Marshall and Rossman (1995, p. 80) suggested that interviewing is simply "a conversation with a purpose".

Interviews constitute an effective data-collection method for three reasons: Firstly, interviews can be considered as a primary means of collecting data since they directly access the necessary information, by accessing what is 'inside a person's head' and allow the researcher to gather in-depth knowledge concerning questions such as: what motivated the respondents and why did they respond as they did? According to Tuckman (1972), this method can provide the researcher with information about what the respondent knows (knowledge or information), a respondent's likes and dislikes (preferences and values), and a respondent's thoughts and opinions (attitudes, positions and beliefs). Secondly, interviews are an effective means for testing hypotheses. Thirdly, interviews are effective in following up unexpected results, and validating other methods.

Interviews are sorted into three types: structured, semi-structured or unstructured (Minichiello et al., 1995; Fontana and Frey, 2000). Structured interviews require questions to be prepared in advance and answers recorded. In semi-structured interviews the researcher can re-sequence the interview questions, modify them, re-phrase them, add different questions, or elucidate the questions, as the situation demands. Unstructured interviews could mean that the interviewer raises some important issues by way of conversation. Strauss and Corbin (1998, p. 205) suggested that an interview guide or schedule should be used as a means of opening discussion, but they thought that despite this predetermination of questions, a researcher should give interviewees more room to answer in terms of what is important to them. In a semi-structured interview, the researcher prepares a list of questions and gives the interviewees' responses latitude, so that the responses may deviate to some extent from the researcher's expectations. Unstructured interviews, on the other hand, are conducted as a dialogue, whereby the researcher asks a single question and the interviewee responds freely.

Since open-ended questions were needed to elicit this broad information, a semi-structured interview was considered more suitable than a structured interview that would limit the responses. Semi-structured interviews enabled me to discover "*what the interviewee views as important in explaining and understanding events, patterns, and forms of behaviour*" (Bryman, 2001, p.314). The focus of the interview is decided by the researcher as there may be areas that the researcher is interested in exploring, so that the interview is conducted in a fairly open framework which

allows for focused, conversational, two-way communication. Often the information obtained from semi-structured interviews provides not just answers, but reasons for the answers (Silverman, 2005).

The semi-structured interview was chosen for this research, to attain benefit from a number of predetermined interviewer questions, but also enabled certain spontaneous questions to arise as a result of the discussion (Wengraf, 2001). It allowed me to acquire information in real-time, ask for explanations for ambiguities, and look deeper for more information within a fairly open framework, using conversational, two-way communication, while maintaining the right focus.

An important aspect of the interview technique is that the interview can be tape-recorded and later transcribed providing a protocol for detailed analysis. In some circumstances it makes more sense to interview rather than send a questionnaire. The choice is based upon how many people need to be surveyed, the depth of the questions and the resources available to complete the research (time and money).

In addition to the semi-structured interviews, open-ended questionnaires were also employed in Stage One to supplement the data with information gathered from a larger research population. Self-completion questionnaires cut out travel time and travel costs and are faster to administer. Additionally, the respondents have the advantage of being free to work at their own convenience and pace. The fact that questionnaires can be easily and conveniently sent via email also influenced my decision to use the open-ended questionnaire. Admittedly, interviews have the advantages of probing and clarifying, but this can also be accomplished if necessary over the telephone (Bryman, 2004; Cohen et al. 2001). Convenience considerations determined the decision to use open-ended questionnaires in addition to semi-structured interviews with a ratio of three questionnaires to every one interview. Accurate details concerning the data-collection process appear in the next chapter (Chapter 8).

Stage Two: The Closed-ended questionnaire

Stage Two attempted to measure the identified success factors, testing the categories that had emerged from Stage One. Measurement necessitated the use of a quantitative research tool and a closed-ended questionnaire was chosen to record the levels of significance that the respondents attributed to the identified success factors. In this way I was able to measure and analyse the relationships between the different variables (Denzin and Lincoln, 1998).

Closed-ended questions are questions with a finite set of answers from which the respondent chooses. These questions can normally be answered using a simple 'yes' or 'no' option, or a selection from multiple choices. The benefit of the closed-ended questions is that they are easy to standardise, and the data gathered from this kind of questionnaire lend themselves to statistical analysis. In contrast to the open-ended questions that allow respondents to use their own words, and therefore make it difficult to compare the meanings of the responses, closed-ended questions can be more specific, and the responses for each question are therefore more likely to communicate similar meanings. Closed-ended questions are better suited for coding and for computer analysis (Dörnyei and Taguchi, 2009). One advantage of using closed-ended questionnaires is that they can easily be pre-coded, thus making the processing of data by computer analysis a fairly simple task. Other advantages are expressed in large-scale surveys, as closed-ended questions require less time from the interviewer, the participant and the researcher, and so they are a less expensive survey method, achieving a higher response rate than questionnaires that use open-ended questions. The down side to closed-ended questions is that they are more difficult to write than open-ended questions. This is because the evaluator must consider all choices in advance and design the questionnaire to include all the possible answers a respondent could give for each question (Fink, 1995). The closed-ended questionnaire was chosen as a quantitative method to derive statistical measurements of the factors identified in the qualitative stage of the research.

7.6 Triangulation, Validity, Reliability, and Generalisability

7.6.1 Triangulation

Qualitative research has been criticised as a non-scientific approach because its reliability and validity are open to question. As Patton (2002, p. 247) indicated, one important way to strengthen the reliability and validity of a research study is through triangulation: "*triangulation strengthens a study by combining methods. This can mean using several kinds of methods or data, including using both quantitative and qualitative approaches*". Triangulation involves a comparison of different data or data derived from different methodologies in the study of the same phenomena (Patton, 1990; Cunningham, 1997). Using various approaches to collect data means that the research will not become constrained by the nature and limitations of one method. It enables the researcher to gather insights that might not have been possible with a single approach and to 'see' the subject from a variety of angles. There are at least two ways to corroborate the information gathered: 'data triangulation" using different data sources (different research subjects), and 'methodological triangulation' comparing data gathered through multiple methods (Guba and Lincoln, 1994; Miles and Huberman, 1994).

This research employed triangulation between data from three different sources (two qualitative and one quantitative) cross-checked over various data sets, employing one set of data to enhance understanding of another set. This technique enabled me to explain, in detail, the richness and complexity of human behaviour, by studying it from the respondents' different points of view (Cohen, Manion and Morrison, 2001). Bryman (2004, p.275), suggested that this mixed approach fosters "*greater confidence in the findings*". Triangulation therefore improves the validity and/or reliability of research findings.

7.6.2 Reliability

According to Mason (2002, p. 21): "*validity, reliability and generalisability are different kinds of measures of the quality, rigor, and wider potential of research, which are achieved according to certain methodological and disciplinary conventions and principles.*" Bryman (2004) defined reliability as the degree to which a measure of a concept is stable, meaning that if the research is replicated using the same methods of data-collection and analysis, then the claims and

conclusions derived from the data should be the same. This rigid view of reliability is especially common in most scientific research, using quantitative methodology. Contrastingly, Stenbacka (2001) argued that since the issue of reliability concerns measurements, it has no relevance in qualitative research. Similarly, Spencer et al (2003) argued that concepts relating to quality developed for quantitative research such as generalisability, validity, reliability and replicability cannot or ought not to be applied to qualitative research.

Despite these views, criteria are needed to judge research quality. Patton (2002) felt that it was important for qualitative researchers to consider the validity and reliability of their work, when designing a study, analysing results and judging the quality of the study. Although, early qualitative researchers felt that they needed to apply traditional notions of validity and reliability to their results in order to justify their credibility, later writers (Miles and Huberman, 1994; Yin, 1994) developed their own language to describe the criteria for quality in a qualitative research paradigm. For example, while the terms 'validity' and 'reliability' are essential criteria for quality in quantitative paradigms, in qualitative paradigms the terms 'credibility', 'neutrality' or 'confirmability', 'consistency' or 'dependability' and 'applicability' or 'transferability' were suggested as the essential criteria for quality (Lincoln and Guba, 1985).

Also attempting to increase confidence in qualitative research, Miles and Huberman (1994) concentrated on improved and rigorous techniques for data gathering and analysis as the best way to enhance credibility and acceptance. Yin (1994) suggested that support for reliability can also be achieved by maintaining and publishing a detailed record regarding the research process and the way in which data were gathered and interpreted and use of formal protocols, which were produced at the research site. Miles and Huberman (1994) indicated that the researcher should also test the extent of consistency of the research, and whether it is based on a logical foundation.

7.6.3 Validity

In quantitative research, the validity of a study is determined by the extent to which the research truly measures what it was intended to measure, or how 'truthful' the research results are or in other words whether the researchers are observing, identifying, or 'measuring' what they say they are (Mason, 2002).

Internal validity is achieved when the researcher demonstrates that the explanation given for a specific event comes directly from the collected data. External validity relates to the extent to which the results can be generalised to a wider population, case or situation (Bryman, 2004; Cohen et al., 2001). According to Denzin and Lincoln (1998, p 186), if the findings correctly report the thing being measured; then internal validity is high. If the findings can be generalised to other similar phenomena, then external validity is high.

Since qualitative data are often unique and results cannot easily be generalised to other circumstances, Lincoln and Guba (1985) preferred to refer to the internal validity of a qualitative study as 'trustworthiness' and external validity as 'transferability'. The validity of the structure is reinforced when the researcher makes use of varied sources and relies on a detailed chain of evidence amassed during data-collection.

Lincoln and Guba (1985) pointed out, that both qualitative and quantitative research methods emphasise truth, consistency, applicability, and neutrality while taking different procedural approaches to ensure quality.

7.6.4 Generalisability

According to Collis and Hussey (2003), generalisation involves the application of research results to cases or situations beyond those investigated in the study. The term 'generalisability' is used to describe the application of findings or methods from elsewhere to a range of situations or units of study in order to contribute to the understanding of those other situations. Guba and Lincoln (1982) suggested replacing the idea of generalisability with 'fittingness', assessing the extent to which the situation being studied conforms to other situations. Possibilities for generalisability may increase when detailed information is given.

According to Bryman (2004), because qualitative research uses small samples of respondents it is therefore high on validity, but low on reliability, and cannot be directly generalised from one setting to another. However, qualitative data relating to the researched situation can be used as a base for analysing new situations, comparing similarities and differences.

Quantitative data, on the other hand is generalisable from sample to source population. By using both qualitative and quantitative mixed methods, this research

intended to increase the applicability of the collected data, so that it might be useful in a wide range of real-life situations.

7.7 Data-analysis methods

Data-analysis methods are chosen according to the guiding research approach. Since Stage One involved two qualitative data-collection tools, semi-structured interviews and an open-ended questionnaire, a qualitative analysis was needed. Patton (2002, p.453) explained that "*any qualitative data reduction and sense-making effort takes a volume of qualitative material and attempts to identify core consistencies and meanings"*. Qualitative data consists of words and meaning and therefore description constitutes the basis for the analysis. Denzin (1978) pointed out that description includes information about the context and the context constitutes an important recurrent theme in qualitative analysis.

In order to understand and interpret the descriptions provided by the respondents, content analysis was chosen as the method of analysis for the collected data, relating to the literal text. According to Weber (1990), content analysis is a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding. It has many uses and advantages such as enabling researchers to sift through large volumes of data with relative ease in a systematic fashion, allowing researchers to discover and describe the individual, group, institution, or society. It is also a useful technique for monitoring shifts in public opinion as data collected in one point of time can be compared to data collected at some other point in the future.

There are several different types of qualitative data analysis. Strauss and Corbin (1990) suggested that analysis should begin with the identification of the patterns or themes emerging from the raw data. Content analysis has been used fruitfully in a wide variety of research applications as one of the most extensively employed analytical tools for qualitative research (Allen and Reser, 1990).

In Stage Two data were gathered with a close-ended questionnaire and required quantitative procedures of statistical analysis. Quantitative methodology produces numbers that can be manipulated with various statistical methods. In quantitative analysis, numbers and their interpretation provide the material for simple statistical analysis using universal rules and standardised procedures, assisted by computer

software such as SPSS or SAS (Statistical Package for the Social Sciences, Statistical Analysis System) (Blake, 2003). Then the results of this analysis are presented with common descriptive statistics (frequencies, percentage, mean, median, range, standard deviation, variance, ranking, statistical significance, factor analysis), and inferential statistics (outcomes of statistical tests, helping deductions to be made from the collected data to test hypotheses and relating findings to the sample or population), tables or graphs.

7.8 Ethical considerations

In order to preserve the privacy and professional and personal safety of the study's respondents, it was necessary to relate to certain basic ethical considerations during the data-collection process. According to Macburney (1998), in any research there may be a conflict between the commitment of the researcher to expand knowledge and the potential benefits the research may have to the society and the cost of the research to the participants. This conflict should be addressed by response to ethical considerations.

Diener and Crandall (1978) classified ethical principles according to four areas of concern: avoiding harm to participants, ensuring informed consent, avoiding invasion of privacy, and deception:

Avoiding harm to participants: this includes avoiding physical harm, stress, loss of self-esteem, and "*inducing participants to perform reprehensible acts*" (Bryman, 2001, p. 479). The researcher has to act thoughtfully and carefully in inaugurating research strategies since it is possible to harm participants without any intent or maliciousness (Beauchamp and Childress, 1979).

Ensuring informed consent: the notion of informed consent implies that a respondent should be fully informed, from the very beginning of their participation in an interview or questionnaire, about the details of the research process, including any use of observation equipment or recording devices (Bryman and Bell, 2007). Wolfensberger (1967) indicated that participants should consent freely to serve in an experiment, when they adequately understand both what is required of them and any possible 'cost' or risk to them. Diener and Crandall (1978) agreed that this procedure protects individual autonomy by allowing individuals to make decisions about processes that directly concern them. Lack of informed consent may occur as a result

of disguised or covert observation. In some cases the researcher might feel that giving all the information about the concern and the focus of the research may either influence the participants' behaviour, or direct and bias their answers, however ethical principles require that the participants should be informed of their possible exposure or any risk towards them.

Avoiding invasion of privacy; this principle is also connected to informed consent since it relates to the consequences of the participants' involvement in the research. An individual's right to privacy is an ethical value in itself. In the research context, it means that an individual has the right to choose whether to participate in a survey, to respond to certain questions or even to withdraw (Sekaran, 2003). Protecting individuals' right to privacy is very important in every democratic society and violating people's privacy in the name of science is not acceptable. Therefore, it was important to maintain the anonymity and confidentiality of the participants in this research.

Avoiding deception: deception may occur when the researcher misrepresents the true purpose of the research, trying to create a false impression by disguising the real objective of the survey in order to obtain important information and to avoid reactivity and bias. Zikmund (2003) suggested that deception (that is widely employed in social research) can be justified only in cases where no physical or psychological harm will be caused, and the researcher takes personal responsibility to inform participants about the concealment or deception at the conclusion of the study.

7.9 Summary

This chapter provided an overview of the rationale for the study. It explained considerations guiding the choice of study design, and described the options selected for the research methodology. A summary of these choices is presented in Table 7.1 below.

Table 7.1: The chosen research design

Methodology	**Choice**	**Justification for the choice including reference to the conceptual framework**
Paradigm	Post-positivist (Phenomenological)	* Aim: developing insights and propositions * Research questions * Issues under study – people's perceptions * No hypothesis to pre-determine the outcomes
Research Design	Inductive-naturalistic	* Based on field work and my professional life experience * Research conducted within people's natural surroundings * Aim- developing understanding * Data collected from the particular to the general
Research Approach	Mixed methods	Qualitative + Quantitative
Stage One: Qualitative Methods	* Semi-structured Interviews * Open-ended Questionnaire	Revealing success or failure factors regarding the implementation of outsourcing in organisations utilising ERP systems in Israel.
Method of analysis	Content analysis	Identifying themes and categories
Results of Stage One: Formulating propositions for Stage Two		
Stage Two: Quantitative Methods	* Closed-ended Questionnaire	Testing the identified success factors formulated as a result of **Stage One.**
Method of analysis	Statistics	Measurement of the extent of significance attributed to the different factors.
Results of Stage Two: Presenting insights and propositions		

The next chapter will describe the implementation of these guiding principles in the application of the chosen methodology for this research.

Chapter 8: The Research Process: Applying the Chosen Methodology for Data-collection

This chapter describes the application of the chosen methodology: mixed methods research employing both qualitative and quantitative methods. It describes the field work process, the characteristics of the research population and the research tools used in this study.

Guided by the research purpose, the research questions, the conceptual framework and research design, the research was conducted in two successive stages: Stage One followed a qualitative approach, employing semi-structured interviews, and an open-ended questionnaire, while Stage Two followed a quantitative approach, employing a close-ended questionnaire (see Table 8.1 below). The purpose of the semi-structured interviews and the open-ended questionnaire utilised in Stage One was to identity success factors for the employment of IT Outsourcing in different organisations utilising ERP systems in Israel as perceived by participants, while Stage Two tested the significance of the success factors identified in Stage One.

Table 8.1: The research process

	Stage One	Stage Two
Approach	Qualitative	Quantitative
Methods (N)	• Semi-structured Interviews (5) • Open ended questionnaire (15)	• Close-ended questionnaire (72)
Analysis	Content analysis	Statistical analysis

The research was undertaken within organisations in Israel that had adopted ERP systems and used IT Outsourcing as a strategy for the implementation and maintenance of those systems. The organisations were selected to represent various industrial categories, according to their scale, (medium to large sized organisations, determined by their level of income and sales and number of employees) and the fact that they had had sufficient years of experience in implementing the ERP systems. 200 organisations were found which met these criteria.

In both stages of the research the population sample included IT managers, team leaders and other relevant employees of the IT departments in those organisations, who had gained practical and theoretical knowledge and formed opinions about the studied subject through their own personal experiences. Criteria for selection included accessibility for the researcher, willingness to participate, and ability to explain their experience. As an incentive, potential respondents were told they would receive the results of the research so that they could consider themselves in comparison to other respondents' responses.

The research was conducted between the years 2006 to 2008. More specifically, Stage One of the research started with the distribution of the open-ended questionnaire in August 2006, while the semi-structured interviews ran from November 2006 until June 2007. Stage Two of the research was conducted during 2008.

8.1 Stage One: The qualitative study

In order to respond to the research questions, Stage One aimed to identify success factors for the employment of IT Outsourcing in different organisations utilising ERP systems in Israel. In this stage data were collected from five semi-structured interviews (see example in Appendix 8.1) and an open-ended questionnaire (see Appendix 8.2) that was distributed to fifteen experienced IT managers. According to Bryman (2004), in qualitative research, the researcher continues collecting data through observations, interviews, open-ended questionnaires, and documents, until theoretical saturation is achieved. This theoretical saturation refers to the point when emerging concepts have been fully extracted from all the participants, and no new insights are being created

In a qualitative research process the researcher should take due caution in data-collection by ensuring that he or she asks the right questions, gathers the right data, accurately measures the data collected, controlling the research process by determining clear boundaries, obtaining informed consent and ethical approval, and employing an appropriate research methodology. Later stages include: analysing the measurements, and interpreting the analysis to reach conclusions,

When the data from the two research tools, the open-ended questionnaire, and the semi-structured interviews were compared, it was already noted that data derived

from one tool complemented the data that emerged from the other tool. Since the questionnaire in this case did not allow any deviation from the predetermined questions in the on-line process, the interviews afforded the possibility to probe and clarify the issues under study. The interviews thus amplified and sharpened the information gathered from the open-ended questionnaire allowing me to understand the respondents' point of view as a primary data source, accessing authentic data in the respondents' natural surroundings.

Content analysis was performed during and at the end of this stage for the outputs of both the semi-structured interviews and the open-ended questionnaire, and yielded propositions that were later used to prepare the closed-ended questionnaire for Stage Two of the research. The data-collection tools are now described in greater detail.

8.1.1 The open-ended questionnaire

The open-ended questionnaire was designed to identify success factors for the implementation and maintenance of ERP systems with the assistance of IT Outsourcing in different organisations in Israel. The questionnaire was designed to elicit a full, meaningful answer for each question, based on the respondent's own knowledge and/or feelings. Open-ended questions typically begin with words such as "why…" and "how …", or phrases such as "tell me about ...".

The questionnaire was constructed on the basis of the conceptual framework derived from extant literature on the studied issue, guided also by my personal and professional experience as an outsourcer in the IT field, and my experience in ERP projects in Israel

In order to identify and characterise the success factors for the employment of IT Outsourcing in the implementation of ERP projects, fifteen questions were posed in relation to four areas of concern: (1)the perception of (selective) IT Outsourcing, (2) motivation for the employment of IT Outsourcing in ERP projects, (3) possible success factors for the implementation and maintenance of ERP projects with the assistance of IT Outsourcing, and (4) the possible linkage between the need for IT Outsourcing to implement and maintain ERP systems and the success of these projects (see Appendix 8.1). For example, in order to identify success factors for the implementation and maintenance of ERP projects with IT Outsourcing, my questions were: What do you think about integrating outsourcing in an ERP project in the

organisation? Was it a successful enterprise? Why? Was it a failure? What, in your opinion, were the reasons for that? What, in your opinion, are the success and failure factors for the employment of outsourcing in ERP projects ?

The open-ended questionnaire was piloted with three IT managers, in order to test the suitability of the questionnaire to the goals of the research. As a result, some of the questions were refined, including questions in reverse form and clarifying unclear or ambiguous language, while others were removed, because they were found to be irrelevant, and in order to shorten the device so that it would not to be too exhausting.

Glaser and Strauss (1967) and Strauss and Corbin (1998) noted that probability sampling is not suitable for qualitative research frameworks, because of its dependence on statistical rather than on theoretical criteria. They suggested that a "theoretical sampling" enables the researcher to discover categories and their properties and to suggest the reciprocal relationships between categories in order to construct theory.

Theoretical sampling is defined as the process of selecting "*incidents, slices of life, time periods, or people on the basis of their potential manifestation or representation of important theoretical constructs*" (Patton, 2001, p. 238). According to Glaser and Strauss (1967) this sampling method aims to develop a rich understanding of the dimensions of a concept across a range of settings and conditions. Glaser and Strauss (1967, p. 45) explained: "*Theoretical sampling is the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyses his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges*". According to Elliott and Lazenbatt (2004, p. 50) "*... this means that the decisions regarding what data to collect are determined by the specific requirements of the theory that is emerging out of the data analysis. In other words, data analysis informs subsequent data collection and sampling*". For the purpose of the open-ended questionnaire, purposive theoretical sampling was considered preferable because of the limited resources and time available, in order to achieve a point of theoretical saturation (when no new additional insights could be brought to the research question) (Family Health International, 2005).

Participants were chosen according to the extent of their experience and knowledge concerning the employment of IT Outsourcing in ERP projects and their status in the organisation as explained in Chapter 7, section 7.1. The sample included IT department managers; it was also thought pertinent to obtain opinions concerning the studied subject from non-managerial employees, who had experience of working together with the IT Outsourcing providers. The managers recommended which employees in their staff would be selected.

In general, the managers were the decision-makers and they were able to see the overall situation in the organisation, the proportion of managers included in the sample was therefore larger than employees, while the employees were able to see a more focused, departmental view of the work with IT Outsourcers on the ERP project. The open-ended questionnaire was emailed to eighteen IT department managers and three employees in the IT departments of the relevant organisations. Completed questionnaires were received from thirteen IT managers and two employees, giving a response rate of 89%. The distribution of the open-ended questionnaire by email provided an appropriate solution for budget and time constraints. It was also convenient for the respondents, who could complete the task in their free time, and I had more time to process the answers because he did not have to schedule meetings with each respondent. Table 8.2 below details the distribution of the respondents by years of experience with the studied subject.

Table 8.2: Distribution of open-ended questionnaire respondents by years of experience with the studied subject

Relevant Experience	IT Managers	Employees
Up to 5 years	**8**	**1**
Up to 10 years	**4**	**1**
Up to 20 years	**1**	
Total	**13**	**2**

The sample population for the open-ended questionnaire included fifteen people, their ages ranging from 25 to 55, six were females and nine males. Thirteen were IT department managers with experience in the employment of IT Outsourcing in various ERP projects in Israel, and two were employees that had been intensively

involved in IT Outsourcing decisions and, prior to their current positions, had acted as consultants and service providers. These experienced people were selected to represent various different usages of IT Outsourcing in ERP projects in Israel. All the respondents had both personal and professional experience concerning the issues studied in the research. The respondents were selected from various industries Table 8.3 below shows the distribution of the respondents according to type of industry.

Table 8.3: Distribution of open-ended questionnaire respondents by type of industry

Industry Type	Communication	Oil and Chemicals	Services	Food
Number of participants	3	3	4	5

8.1.2 Semi-Structured Interviews

As noted in Chapter 7 that detailed the research methodology, the principal objective of the five interviews conducted in this research was to access the perceptions of IT Outsourcing users in ERP systems, in order to reveal their attitudes and beliefs regarding the role of IT Outsourcing functions and processes in the Israeli ERP projects, and the factors which they believed were influential for successful outcomes of the employment of IT Outsourcing for ERP implementation and maintenance. The interviews were conducted solely by me, a consultant and a provider of IT Outsourcing services in the IT field for many years.

The interviews were presented to the respondents as a method of gathering information for the research purposes. Since I had a former acquaintance with the respondents this helped me to gain their consent to participate in the interviews. Strauss and Corbin (1998, p.51) suggested that: "*Before beginning a project, a researcher can turn to the literature to formulate questions that act as a stepping off point during initial observations and interviews. Although new areas will emerge, at least the initial questions demonstrate overall intent of the research*." The interviews were piloted, and then the questions were refined, to maximise effectiveness for the research.

Examples of questions used in the interview are given below. The interview questions were designed to obtain information to respond to the research questions, aiming to gain access into 'the heads' of the IT managers, eliciting their perceptions and views regarding the success and failure factors for the employment of IT Outsourcing in ERP projects in Israel.

The questions were :

1. Please tell me about your experience with ERP outsourcing.
2. How would you define the implementation of ERP outsourcing in your organisation? To what extent has it been successful in your eyes?
3. Why has/hasn't it been successful in your organisation?
4. Would you advise other managers to integrate ERP with the assistance of outsourcing in their organisations? Why?
5. In your opinion, what can an organisation do in order to promote the successful implementation of ERP through outsourcing?
6. Do you envision that your organisation could operate without employing outsourcing? Why?

In order to make the interviews convenient for the respondents, the interviews were held in the organisations where they were employed. My willingness to accommodate the respondents' needs allowed me to acquire a broad picture of organisational activities in several areas, such as: trade companies, academic campuses (University), High Tech, or production factories. To increase the accuracy of the data-collection, Burns (1994) recommended that tape-recording has the obvious advantage of recording the subject's responses verbatim while freeing the interviewer to participate in the dialogue without the need for note-taking. This advice was adopted and interviews were tape-recorded with the respondents' consent.

The "General Interview Guide Approach", as defined by Patton (1990) was employed for the interviews, since an interview guide provides a clear framework enabling the researcher to make the best use of limited time, and to cover all the areas relevant to the interview Using an interview guide ensures that "*basically the same information is acquired from a number of people*" (Patton, 1990, p.283), it improves the comparability of the data (Flicks, 2002) and thereby enhances

confidence in the findings. Concepts that evolved from comparisons between data from different respondents then formed the basis for further data gathering (Strauss and Corbin, 1998, p. 205).

8.2 Stage Two: The quantitative study

Stage Two sought to further understanding of the success factors for the use of IT Outsourcing within ERP projects in Israel, including the levels of significance that people attribute to those factors. The use of quantitative methods enabled me to cross-check the propositions derived from the data collected in Stage One including the results of the content analysis. For this purpose, a closed-ended questionnaire was created on the basis of the themes that emerged from the semi-structured interviews and the open-ended questionnaire used in Stage One.

8.2.1 The closed-ended questionnaire and its rating scales

According to Bryman (2001, p.66) "*measurement allows us to delineate fine differences between people in terms of the characteristic in question*". Furthermore, a measurement generates results that are not influenced by the context of the research, by its time or by the researcher. Finally, a measurement provides a basis for more precise estimates of the degree of relationships between concepts. Because no published measures of the success factors for IT Selective Outsourcing in ERP projects in Israel were found, a specially designed closed-ended questionnaire with a five-point Likert-type scale was constructed to try to measure the importance of the success factors identified in Stage One.

Likert scales are commonly used as an approach for attitude measurement (Bryman, 2001, p.120) and allow researchers to measure a cluster of attitudes. An odd-number scale grades statements over five or seven levels of agreement or disagreement, so that respondents can choose a response ranging from "Yes, I strongly agree" to "No, I strongly disagree", with a middle range that allows for a neutral response. Criticism of the Likert scale refers also to rating scales in general, maintaining that while they are effective in measuring attitudes, the interpretation of the grades may be very subjective so that one respondent's "strongly agree" could be another one's "agree". Therefore, the scale should be used to measure one item at a time, it should be subtle – "to what extent", "how far"- rather than dichotomous – "have you", "can you"', and so on. Despite these cautions, a rating scale is a useful device for the researcher,

because it enables a degree of sensitivity and differentiation of response whilst still generating numbers. It is extensively used in research because it "*combines the opportunity for a flexible response with the ability to determine frequencies, correlations and other forms of quantitative analysis*" (Cohen et al., 2001, p. 253).

The items of the Likert scale questionnaire used in this research (see Appendix 8.3) related to two types of statements: The first section of the questionnaire tested the motivations of the IT managers for the employment of IT Outsourcing in their organisation. The second section tested the level of importance of the identified success factors for IT selective outsourcing in ERP projects in Israel in two modes: 'notional' (extent of the factor's importance) and 'actual' (extent to which the factor was actually expressed in the project in the organisation). As noted, the tested statements (questionnaire items) were inferred from the themes that emerged from the open-ended questionnaire and from the semi-structured interviews.

Wiersma (1975) noted that all types of measurement devices will ultimately involve a subject who responds directly to a stimulus, creating the data for the research. In the present stage of the research, the respondents were asked to rate each success factor in response to the question: 'How important do you consider the following factors for the success of the ERP projects?' on a Likert scale of five categories, ranging from 5 - "very high importance", to 1- "very low importance". The questionnaire was initially administered to a separate pilot population of five IT managers in Israel. This pre-test was used to develop, revise, and refine the items to ensure their suitability to the goals of this research. Respondents indicated that there was a need for more specific focus and better explanation of the items and appropriate changes were incorporated.

Pedhazur and Schmelkin (1991) suggested that it is important to use as many respondents as possible to ensure results from a single test. The questionnaire was therefore distributed among seventy two respondents (the maximum number of respondents that could be located and agreed to participate within the time constrictions of the research) . Table 8.4 below summarises the closed-ended questionnaire respondents' characteristics by type of employee and years of experience.

Table 8.4: Distribution of closed-ended questionnaire respondents by type of employee and years of experience

IT Manager	**Years of experience as IT Project Manager**	**No. of Respondents**	**% of total respondents**
	Up to 5 years	6	
	Up to 10 years	13	
	Up to 15 years	4	
Total		**23**	**31.94%**
Employee	**Years of experience as Employee**	**No. of Respondents**	**% of total respondents**
	Up to 5 years	17	
	Up to 10 years	26	
	Up to 15 years	6	
Total		**49**	**68.06%**

Respondents' profiles and sampling:

The research population of seventy two respondents included twenty three IT managers, and forty nine team leaders and IT employees at different levels from a wide range of industrial contexts, and the response rate was 100%. The majority (39) of these respondents had between five to ten years' experience in employment of IT Outsourcing, while a minority (10) had more than ten years' experience, some of them had also been involved in more than one ERP project, and/ or in more than one organisation.

Three IT managers had also had experience with the use of IT Outsourcing for Legacy systems in their earlier steps in the IT field. Therefore, all the respondents in this part of the research had been involved with and experienced the employment of IT Outsourcing for the introduction and maintenance of ERP systems in Israel.

The sampling method employed at this stage of the research was chosen to address the research needs by including people of interest, who could provide the necessary information to achieve this purpose and excluding those who were unsuitable for the purpose (Mason, 2002). According to Patton (1990), this kind of sample is selected by the researcher subjectively when he attempts to obtain a sample that appears to him/her to be representative of the population.

The population of this research was chosen on a voluntary basis as a 'convenience sample' (a sub-type of purposive sampling) using the 'snowball sampling' technique. According to Cochran (1977), a convenience sample is a sample where the respondents are selected, in part or in whole, to meet the convenience of the researcher because of its easy accessibility. It refers to the collection of information from members of the reservoir population (possible random samples) who are conveniently available to provide it (Ritchie and Lewis, 2003).

Snowball sampling is a form of convenience sampling, according to which the researcher makes an initial contact with a small group of people who are relevant to the research topic, and these people themselves suggest additional potential members for inclusion in the group (Bryman, 2001). Snowball sampling uses recommendations to find people with the specific range of skills that has been determined as being useful (Patton, 1990). The snowball sampling technique allowed me to identify the necessary resources within the required community and to select those people best suited for the needs of the research. It helped me to access additional good information sources by selecting colleagues who had experience with the studied subject and who were ready to recommend others in order to make the circle bigger. Although random sampling would usually be appropriate to produce the quantitative data, it would be difficult to attain the necessary response quantity. Volsky, Westbrook and Poku, (2002) indicated that a typical response rate for industrial studies ranges from 15-30%. Therefore, since the response rate in the present study was far above 30% it was considered to be acceptable.

8.3 Triangulation of the findings

Following the principles described by Mason (2002), triangulation was employed in this research to fortify the findings from a thorough exploration of IT Outsourcing issues in general, and the use of IT Outsourcing in ERP projects in Israel in particular. Two types of triangulation were conducted: 'data triangulation' using different data sources and 'methodological triangulation' comparing data gathered through multiple methods (Guba and Lincoln, 1994). The entire multi-strategy research design was dubbed as an 'H1' triangulation type by Hammersley (1996), referring to the use of quantitative research to confirm qualitative research findings.

A deeper understanding of evidence was reached by repetitive readings followed by analysis of the various sets of data. Data from three different sources (two qualitative and one quantitative) were cross-checked over various data sets, employing one set of data to enhance understanding of another set. This triangulation strategy was employed to increase confidence in the results of the research (Mason 2002).

8.4 The application of ethical considerations

During the research, strong mutual trust relations developed between me and the respondents, some of whom were my clients, while some others were seen as potential future clients.

The research participants were given information detailing the area of concern of the research and the research objectives, emphasising its potential importance to the IT field and their own decision making processes, in order to increase their involvement. The respondents' informed consent was obtained at every step of the research. Professional and personal care was taken to facilitate the cooperation of the IT department managers and their staff and to expose their thoughts and feelings without causing any harm to them.

The respondents' right to confidentiality and anonymity was strictly maintained in all records obtained for this research; all names were erased or changed in order to avoid identification of the respondents. According to Bryman (2001), it is difficult to maintain the anonymity of respondents in qualitative research; however, in this case pseudonyms were used as a conventional strategy to eliminate the possibility of identifying any of the participants. The fact that I alone had access to the data and analysed them alone reduced any risk of exposure of the participants.

Tape-recording was only used as a means of data-collection during the semi-structured interviews after obtaining the participants' permission. The interviewees were reassured that the interviews were unrelated to any form of evaluation of their practice, and that information collected from the interview would not be used to expose their views or other information to their employees or to expose their organisation to any competitive action, and that their anonymity would be preserved, thus invasion of privacy was avoided. Also, personal or seemingly intrusive information was handled with much sensitivity in accordance with the respondents' conscious willingness and acceptance. I did not use any kind of deception.

8.5 Summary

This chapter described the process of the field work research according to the research design. In Stage One, employing theoretical sampling considerations, information was gathered from five different semi-structured interviews and fifteen open-ended questionnaires until theoretical saturation was achieved. Then the results from Stage One were used to create a closed-ended questionnaire which was administered in Stage Two to a relevant population of seventy two respondents located by convenience sampling with a snowball technique. This questionnaire aimed to measure the success factors of IT Outsourcing in ERP projects in Israel, to enable the emergence of statistical understanding of this phenomenon. The evidence collected through the various methods, the semi-structured interviews and the open-ended questionnaire in Stage One, was triangulated with the data collected with the closed-ended questionnaire in Stage Two, focusing on the success factors for the implementation and maintenance of ERP with the assistance of IT Outsourcing projects in Israel. The next chapter discusses the research findings from both stages of the study.

Section 5: Data analysis

Preview

This section explains how the collected data were collated, organised, and analysed. Chapters 9 and 10 present the evidence and its analysis as it emerged from the three data collection tools, and identify relevant links with current research literature. The evidence is organised into tables and graphs, wherever possible, in order to offer a visual representation of the analysis. The results of this analysis serve as the foundation for the annotation and interpretation of the findings.

The section discusses issues emerging from the open-ended questionnaire, and from the semi-structured interviews in Stage One of the research. It then relates to the results of the closed-ended questionnaire conducted in Stage Two. Finally, in Chapter 10, the results from all three research tools are triangulated, allowing the formation of a reinforced summary of the findings.

Chapter 9: Findings – Analysis of the Qualitative and Quantitative Data

This chapter describes the ways in which the data that emerged from the qualitative and quantitative data-collection tools: open-ended questionnaire, the semi-structured interviews and the closed-ended questionnaire were collated and analysed.

9.1 Analysis of the qualitative data - Stage One

Glaser (1978, p. 56) suggested that the analysis of qualitative data should "*describe and summarise what is happening in the data*". Miles and Huberman (1994) indicated that qualitative data analysis should include three concurrent flows of activity: data reduction, data display, and conclusion drawing and verification. Data reduction refers to the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in transcriptions. In order to reduce and organise the data into patterns, concepts and categories, Strauss and Corbin (1998, p. 100) recommend that *"data* [should be] *broken into discrete parts, closely examined, and compared for similarities and differences*".

One of the most fundamental tasks in qualitative research is theme identification. A coding technique can help the researcher to define and categorise the data (Denzin and Lincoln, 2003). At this stage of the study dominant themes were identified with a coding process, breaking down data into its constituent parts (themes) and giving them names (Bryman, 2001). The themes are derived from the characteristics of the phenomena being studied, from already-agreed-upon professional definitions, from local common-sense constructs, and from researchers' values, theoretical orientation, and personal experience with the subject matter (Strauss, 1987; Maxwell, 1996). According to Cohen et al. (2001), the data analysis in qualitative research is almost all interpretive. It is not an accurate representation, as in positivistic traditions, but more a reflexive reactive interaction between the researcher and the "*de-conceptualised data that are already interpretations of a social encounter*" (Cohen et al., 2001, p.282).

9.1.1 Analysis of the open-ended questionnaire

Five major categories derived from the literature and my experience in the studied field were both employed to construct the open-ended questionnaire: *Strategic, Economic, Technological, and Managerial-organisational* categories, and an additional category was added that related to *Reciprocal relations with IT Outsourcing vendors*. The research also investigated links between IT Outsourcing and ERP, and this issue was considered when defining the main categories of the questionnaire.

Responses to the open-ended questionnaire were analysed according to the recommended guidelines cited above. The text of the responses was read repeatedly to derive initial codes, then subsequently the text was analysed thematically by converting initial codes into focused codes, highlighting repeated issues and labelling them as they appeared in the responses. Themes are derived by identifying and labelling issues which were repeatedly mentioned by different respondents. These labels form the initial codes for issues that seem to be most meaningful. The conversion to focused codes involves reviewing the initial codes and eliminating those that are less useful, combining smaller categories of codes into larger ones. Finally, the themes are organised into larger, meaningful categories (Lofland and Lofland, 1995). At this stage, the emergent categories and their sub-categories were then considered in the context of the study's conceptual framework, drawing knowledge from extant literature and from my own knowledge and experience. The evidence gathered from the written responses in the questionnaires was organised into a grid, referring back to the questionnaire items and to their underpinning categories.

The derivation of themes through the above-mentioned analytical process can be best explained through the following example. Respondents were asked: "What motivated you to use IT Outsourcing in the ERP project implementation?" This question aimed to reveal the reasons why organisation managers' decided to use external IT providers to implement their ERP project. The question prompted various responses including a fully conceptualised definition, which revealed that the organisations' managers valued the importance of outside experience, knowledge, skills, and quality to give the organisation the confidence to safely and successfully launch the complex project, as one respondent commented:

Our motivation was to use reliable professionals in order to be supported by their technical and applicative experience and knowledge. This has given us the confidence to safely launch a complex and critical mission project, maintaining quality and preventing failures due to first time implementation. We also try to transfer the new knowledge by training our internal people while working together in an integrated team of internal and external staffs.

Another response relating to the reasons for employing outsourcing was:

[IT Outsourcing was needed as a response to] *...the extent of the resources which did not exist in the organisation. Professional experts have knowledge that doesn't exist in the organisation. The experts have specific IT skills, well experienced analysts that usually cannot be found internally or trained up in-house. From a professional and responsible* [outsourcing] *company, the organisation's management can obtain an obligation to a schedule, products and a closed and defined budget for these mission-critical systems.*

The following sequence summarises the process employed to derive themes from the written answers given above according to the above-mentioned process:

Repeated issues ---- > Initial codes ---- > Focused codes --- > Emerging themes

First, initial codes evident in the text were identified, for example:

- *Experts usually cannot be found internally or trained up in-house*
- *Gaining access to specific IT services and skills such as well-experienced analysts*
- *Requirements for rapid deployment of mission-critical systems*

Then the common theme of these responses such as 'gap in knowledge and experience' was defined. This theme would later be assigned to the appropriate predetermined category, which in this case would be *Technology*. Thus, each category consisted of various themes that emerged from the questionnaires.

In some cases the content analysis process started with a unit of meaning such as: "*cross-organisational projects require a deep level of understanding of the ERP package and of the organisational processes in the context of their surrounding environments. Therefore, they require past work-experience on similar projects. That's why outsourcing plays such an essential role*", which was then converted to a

condensed unit of meaning: 'Knowledge and past-experience is required to implement ERP projects', and transferred to the theme: 'ERP requires knowledge, technical and applicative experience' where the component of the theme is 'gap in knowledge and experience in the organisation' and finally the themes are gathered into a common category: *Technology* (knowledge)'.

The process described in the above example was applied to all other responses. All were scanned and treated in the same manner, some of them were detailed and some were more concise. Contradictory responses were also carefully considered in order to reveal deviations that could illustrate the more conventional responses. Finally, all the emerging themes were organised into the pre-defined categories (see Appendix 9.1 and Appendix 9.2), as detailed below:

The *Strategic* category included the following themes:

1. Maintaining the organisation's core-competence,
2. Maintaining strategic assets,
3. Failure is deadly risky for the organisation,
4. IT Outsourcing is the actual *de facto* procedure employed to implement ERP,
5. Strategic risks are involved in outsourcing.

The *Technology* category included the following themes:

1. Gap in knowledge and experience,
2. Adequate ERP implementation strategy,
3. ERP is package-based generic enterprise software,
4. Tools and packages,
5. Problems with maintenance of the old systems,
6. Desire to replace the aging IT architecture or technology,
7. Drawbacks of ERP Implementation.

The *Economic* category included the following themes:

1. Increased control of IT expenses,
2. Economic considerations,
3. Economic benefits,
4. Cost saving is questionable,
5. Economic drawbacks of ERP implementation.

The *Managerial and Organisational* category included the following themes:

1. Pre-conditions for success,
2. Managerial considerations,
3. Operational issues,
4. Work Teams,
5. Organisational behaviour.

The *Interaction with Outsourcing Vendors* category included the following themes:

1. Trust and cooperation,
2. Contract and Legal issues,
3. Operational issues,
4. Selection of vendor,
5. Maintaining experts' knowledge within the organisation.

Findings from the open-ended questionnaire:

An indicator for the significance of the themes that emerged from the collected data is the frequency of responses. Each theme contained several relevant codes, so that each time that one of these codes appeared in the answers it was assigned to the theme and was taken into account to calculate the frequency of response for that theme. Frequency of response was calculated by the number of times that a theme emerged, and then recurred. Different responses that were similar and frequent were clustered together because of their relation to a limited number of factors. When a

cluster of themes could be easily related to the conceptual framework, it was assigned to a category, and was included in the findings. In order to make sense of the data and extract meaning from it, the mean rates of frequency were calculated and organised in Table 9.1 below, in a logical sequence (descending order of importance) for sample themes (the full analysed list of themes appears in Appendix 9.2). Mean rates of frequency are calculated by dividing the total number of mentions of a theme by the number of respondents, and the result indicated the relative importance of the theme. For example the mean rate of frequency for the theme 'Gap in knowledge and experience' was calculated according to a total of 41 appearances divided by 15 (respondents), and yielded 2.73 as a relatively high score. As noted, the calculation of the mean rate of frequency for the complete list of themes is presented in Appendix 9.2.

Table 9.1: Mean rates of frequency for emergent themes by category in descending order of importance by category

No.	Theme	Mean rate of frequency	Category
1	Gap in knowledge and experience	2.73	Technology
2	Operational Issues	2.27	Managerial and Organisational
3	Economic benefits	2.13	Economic
4	Maintaining the organisation's core-competence	2.00	Strategic
5	IT Outsourcing is the de-facto procedure when implementing ERP	1.93	Strategic
6	Drawbacks of ERP Implementation	1.87	Technology
7	Managerial considerations	1.87	Managerial and Organisational
8	Increased control of IT expenses	1.80	Economic
9	Economic considerations	1.80	Economic
10	Tools and packages	1.73	Technology
11	Contract and legal issues	1.67	Interaction with outsourcing vendors

No.	Theme	Mean rate of frequency	Category
12	Pre-conditions for success	1.53	Managerial and Organisational
13	Work teams	1.47	Managerial and Organisational
14	Failure is deadly risky for the organisation	1.33	Strategic
15	Maintaining experts' knowledge within the organisation	1.27	Interaction with outsourcing vendors
16	Operational	1.2	Interaction with outsourcing vendors
17	Trust and cooperation	1.07	Interaction with outsourcing vendors
18	Economic drawbacks of ERP implementation	0.93	Economic
19	Selection of Vendor	0.87	Interaction with outsourcing vendors
20	ERP is package-based generic enterprise software	0.80	Technology
21	Maintaining strategic assets	0.73	Strategic
22	Organisational behaviour	0.67	Managerial and Organisational
23	Strategic risks involved in using outsourcing	0.60	Strategic
24	Adequate ERP implementation strategy	0.53	Technology
25	Cost saving is questionable	0.47	Economic
26	Desire to replace the aging IT architecture or technology	0.40	Technology
27	Problems with maintenance of old system	0.20	Technology

Comparison of the mean rates of frequency revealed that respondents had indicated that the 'gap in knowledge and experience' theme in the *Technology* category was the most significant theme, with a mean score of 2.73. This signifies a wide consensus concerning the existence of this reason for outsourcing among the

respondents, reflecting their strong understanding that ERP projects require knowledge and experience which does not exist in the organisation. This finding is consistent with the findings of other ERP researchers such as Parr and Shanks (2000a) Harrell, Higgins, and Ludwig (2001); Hong and Kim (2002) and Al-Mashari et al. (2003).

The gap of 0.46 in mean rate of frequency between the first and the second component corroborates the fact that the theme: 'gap in knowledge and experience' was seen by the respondents as the most important reason for outsourcing, far more than the other reasons. The 'operational issues' theme in the *Managerial and Organisational* category was rated in second position with a relative frequency of 2.27, while the 'economic benefits' assigned to the *Economic* category was third in order of importance with a relative frequency of 2.13.

The first four themes, assigned respectively to the *Technology, Managerial and Organisational, Economic*, and *Strategic* categories respectively, were rated at a relative frequency of over 2.00, but the last category *Interaction with outsourcing vendors* appeared to have less significance since it was rated only in the eleventh position with a score of 1.67.

The final theme in the list, measured with the lowest relative rate of frequency (0.2) in Table 9.1 above, was 'problems with maintenance of the old systems' assigned to the *Technology* category This theme reflects a concern relating to the old legacy systems in the organisation which sometimes have to continue to operate until an agreed milestone is reached or after conversion to the new system, but since the knowledge about them already exists in the organisation this appears to be a less strong motivation to involve outsourcing.

An analysis of the relative rates of frequency for the constituent themes in each category (derived from the content analysis) show some significant findings. The themes rated first in each category were: *Strategic*: 'Maintaining the organisation's core-competence; *Technology*: 'Gap in knowledge and experience'; *Economic*: 'Economic benefits'; *Managerial and Organisational*: 'Operational Issues'; *Interaction with outsourcing vendors*: 'Contract and Legal issues'

Some themes did not attain high rates of frequency, perhaps because they were considered obvious – such as the fact that the ERP package is generic (0.80), or the strategic importance of the ERP project's success (1.33). It is worth mentioning what is missing or noted in a minor way – the issue of direct costs – 'cost saving is questionable' (0.47) although there was clear overall support for 'economic benefits' (2.13). It is also noted that 'success factors' as such were not defined at this stage as an independent theme because they were later derived from the sum of various themes or subcategories of the five main categories.

9.1.2 Analysis of the semi-structured interviews

The semi-structured interviews lasted an average of 45 minutes. A predetermined interview script was used, consisting of a set of guiding questions used as starting points, enabling me to then follow the process of the respondents' thinking in depth, posing new questions as relevant to elaborate on the first answers from the respondent. This interactive technique provided the necessary flexibility to probe for details and enabled me to obtain quite deep data (King, 1994).

The interviews were audio-taped, and then translated from the original Hebrew verbatim into English, to allow the analysis to be easily reported in English. My reflections on the interviews were written immediately after the interviews were transcribed, while the events were still fresh in his mind.

Content analysis was applied to the transcripts of the interviews me to cluster issues from the respondents' answers to the different lines of questioning in the interviews. Initially a line-by-line analysis of the interview transcripts was performed, underlining significant words and sentences that contained the respondents' views, thoughts, ideas, attitudes, feelings or experiences, incidents or units of meaning (Rennei, Phillips and Quartero, 1988) concerning the implementation and maintenance of ERP projects with the assistance of IT Outsourcing. The comments derived from the transcripts were compared for similarities and differences, then grouped and labelled in order to sort the phenomena that were mentioned in the data into the relevant areas of interest. Labelling or naming enabled a common heading to be allocated to similar phenomena (events, happenings, objects, and actions/interactions), and to identify recurrent patterns or codes in the data (Strauss and Corbin, 1998).

As each new mention of a concept was identified, it was compared to the previously labelled concepts so that it could be assigned to several codes. According to Glaser (1978) the labelled code (or category) conceptualises the underlying patterns of empirical indicators within the data. In the case that a newly identified concept did not appear to fit in, new categories were created or existing categories were revised.

Thus, the data gathered through the semi-structured interviews was analysed by identifying and highlighting each meaningful comment derived from the data, and then sorting and classifying these comments into categories. For example, "*the first reason to bring in an external IT provider is to gain skills that we don't have internally*" was grouped together with "*our motivation was to use reliable professionals in order to gain high quality production*", because both phrases dealt with 'motivation to use IT Outsourcing'. After grouping the comments in the required category, the category was given a name. In the above example, this was 'motivation to use IT Outsourcing'. This was an inductive process in which the categories emerged from the data rather than assigning comments to pre-determined categories. Later, all the categories that were similar in meaning were clustered into groups producing five main issues. The process of grouping and counting the comments is presented in Appendix 9.3.

The category: 'motivation to use IT Outsourcing' was necessary at this stage of the analysis, since the information that it contained contributed to the understanding of the studied issue and provided source material to answer the main research questions. The issue of motivation is also considered as another indicator of the success of outsourcing in the implementation and maintenance of an ERP project, since it points up the needs and goals of the organisation that led to the decision to employ outsourcing and these motivations constitute expectations that can always be compared to the actual results to see whether the goals and needs were met.

To exemplify the interview process, in order to relate to the research question: "To what extent does the use of IT Outsourcing within ERP projects, differ from the use of outsourcing in traditional software projects?" questions such as the following were asked:

Q: *Is Outsourcing a must? Can an organisation start a new ERP project without being assisted by outsourcing? Do you know of any organisation that has done this?*

An example response*:*

A: *I wouldn't recommend anyone to do that* [i.e. not to use outsourcing]. *I would consider another question on this matter … whether just one outsourcing vendor is sufficient. I mean, what I have hinted before… double check with the professional bodies. Often professional A brings his knowledge, his understanding from the three applications that he did before, and to bring in different viewpoints on the same issue - to bring an additional expert or second opinion for each decision is correct, and I wouldn't recommend otherwise".*

Findings from the semi-structured interviews:

The analysis ultimately yielded five main issues:

- *Motivation to employ IT Outsourcing,*
- *Success factors,*
- *The critical impact of ERP success or failure on the organisation's performance,*
- *The organisation-vendor relationship*, and
- *Problems involved in using IT Outsourcing in an ERP project*.

As noted above, the issues were formed from the participants' meaningful comments. For example, 'motivation to employ IT Outsourcing' was derived from comments such as "*to gain skills that we do not have internally*" and "*flexibility in performing the projects*".

The emergent issues are presented in Table 9.2 below, in descending order of importance, calculated as the percentage of comments given to the particular issue in the interviews. The percentage was calculated by division of the number of comments concerning the issue by the total number of comments. These percentages indicated the relative importance of the issue. For example the percentage of comments for the issue "Motivation in using IT Outsourcing" was calculated as 61 comments on the issue divided by 163 comments multiplied by 100, which yielded 37.42%.

Table 9.2: Issues emerging from the semi-structured interviews in descending order of importance (% of comments)

Main Issue	No. of comments	Percentage of all comments
Motivation to employ IT Outsourcing	61	37.42%
Success factors	56	34.36%
The critical impact of ERP success or failure on the organisation's performance	21	12.88%
Organisation- vendor relationship	17	10.43%
Problems involved in using outsourcing in an ERP project	8	4.91%
Total	163	100%

In total, the analysis of the interview transcripts revealed 163 comments relating to the above-mentioned five issues. The distribution of the comments gives some indication of the importance and the width of the issue in question, although it is noted that some comments were extracted from the responses to questions relating explicitly to these issues and therefore naturally received more pertinent comments. It is also interesting to see the internal distribution of all component subjects within the main issues in Appendix 9.3.

9.2 Analysis of the quantitative data - Stage Two

9.2.1 The Closed-ended questionnaire

The closed-ended questionnaire was constructed with careful attention to details. It was designed on the basis of the themes that emerged from the qualitative data from the open-ended questionnaire and issues that emerged from the semi-structured interviews conducted in Stage One. The questionnaire was printed bilingually, in both Hebrew and English in order to overcome difficulties concerning the understanding of professional terms, allowing the respondents to have an additional source when they encountered unclear items.

The closed-ended questionnaire was divided into three parts:

The first part investigated the reasons for the use of IT Outsourcing in an ERP project (questions a1-a31) which, as noted above, can also be used as base points for the definition of success factors. For example: "*To access and implement new technology*" or "*Acquire expertise not available in-house*" which were given as reasons for the employment of outsourcing in ERP projects also constitute expectations for fulfilment that can be compared with the actual success of the project. In this part of the questionnaire the questions were grouped according to five categories: *Technological, Strategic, Economic, Organisational* and *Managerial*.

The second part of the questionnaire investigated the main research question, relating to the success factors identified in Stage One in two different ways: (1) The extent of the factor's importance (questions b1-b33), and (2) The extent to which the factors were actually expressed in the project(s) experienced by respondents (questions c1-c33). The respondents were asked to indicate the extent to which they perceived the factor as significant, and then how effective the factor actually was in practice in their organisation. The questions relating to the success factors were arranged according to four categories relating to 'top management attitude and commitment',' selection of vendor and contract', 'working and managerial process with vendor', and 'strategic and organisational aspects'.

The third part of the questionnaire asked the respondents for data concerning their affiliation to the organisation: the area of activity of their organisation, their position in the organisation and in the project, and their experience in the field. This additional information provided more options and a better resolution for the data-analysis. Some direct questions related to the linkage between the ERP project and IT Outsourcing including the significant yes/no question “Is it possible to succeed in an ERP project without the assistance of outsourcing?” included in this part of the questionnaire.

In the first and second parts of the questionnaire, each group of factors represents a specific concept, and includes characteristics converted into indicators, by means of common sense understanding, with the assistance of extant thought in the literature (Bryman, 2001). For example, the *Strategic* group included characteristics or

indicators such as 'Be more market competitive', or 'To enable the organisation to focus on core business issues'.

All the indicators were presented for assessment of their relative importance on a Likert scale of five, ranging from 1 as 'very low' (meaning: not important, has little influence) to 5 – 'very high' (meaning: very important, has strong influence).

The questionnaire items were carefully termed so that the respondents could immediately recognise them although there was no prior assignment to the proposed categories. For example the label for a group of factors *Top management* which related to the commitment and the involvement of the top management was defined by the indicators: 'Commitment, involvement and endorsement for the project by the organisation's management', and by 'Definition of goals and methodical planning of the project'. It was important to include both of these indicators of *Top management support* since they appear separately in IT Outsourcing research (Gonzales et al., 2005a) and in the literature on ERP (Sumner, 1999; Wee, 2000; Olson, 2001). The respondents could relate to these indicators according to all their associated meanings and interpretations as they perceived was accurate. Consequently, the indicator 'Overcoming resistance within the organisation before the project begins' was assigned to both the *Strategi*c and *Organisational* groups and was presented as a separate and clear item; although it could also be assigned to *Top management support*.

Some indicators such as 'Tight cooperation between vendor and client' and 'Creation of common vendor-client approach (a win-win situation)' in the *Working and managerial process with vendor* group seemed similar and were very close in meaning. I was aware of this similarity. The interpretation of these indicators depends on the point of view from which they are viewed and the interests of each side in the process: official terms of contract, trust, and mutual respect, definitions of responsibilities, working relation, and attitude. Acknowledging the fact that the two indicators are points on a continuum, they were placed as two different items in the questionnaire for the purpose of this research. Other indicators such as 'Agreement with the vendor concerning contents at the specification stage', 'Definition of detailed work plan for the vendor', and 'Pre-determination of logical timetable for project performance' belong to the 'Selection of vendor and contract' group and stand alone because they are complementing items.

The results of the close-ended questionnaire were coded and processed with a statistical software package (SPSS).

Findings from the closed-ended questionnaire:

The first part of the close-ended questionnaire - Reasons to outsource:

The organisation's different motivations to use IT Outsourcing emerged from the analysis of data collected in Stage One, and they provided a surrogate for the construction of the success factors tested in order to answer the main research question. The respondents' responses at Stage One provided reasons that justify the employment of IT Outsourcing in ERP project in Israel, and these reasons can also be seen as expectations that can be compared with the actual success of implementation and maintenance of ERP projects with IT Outsourcing i.e. they can form the basis for success factors.

In order to measure the significance of the reasons/motivations that emerged from Stage One, thirty one close-ended questions were prepared for the first part of the questionnaire. The reasons for using IT Outsourcing in an ERP project were measured by calculating the mean response points (on a Likert scale of five) for each item/question in the list. The means were calculated by dividing the total number of points given to each item by the number of respondents. For example the mean score for the item relating to the reason/ motivation 'Acquire expertise not available in-house' which was calculated as 4.38 points was calculated by dividing 315 by 72 respondents.

The results for each item (the mean value ranked by respondents) were organised in Table 9.3 below in descending order of importance. Then, another calculation of the mean value was made at group level for each group of indicators (*Technological, Strategic, Economic, Managerial* and *Organisational*), and the result was again organised in descending order of importance. This process in effect triangulated the results from the two data-collection methods used in Stage One with the results from the closed-ended questionnaire in Stage Two. As in Stage One it again emerged that the *Technology* group was seen as the most important group and this therefore validates the findings of the qualitative stage. In general, the five groups of matching indicators at this stage of the research appear to have levels of importance that are compatible to those that appeared from the qualitative findings.

Table 9.3 below shows that The *Technology* group was clearly dominantly perceived as most important: it appeared first at the top of the list and also in the third position, and four items relating to this category appeared among the ten most important items. The *Economic* group also shared the third position as this group considers the reduction in time achieved due to the use of 'experts' (and indirectly - the reduction in cost). The *Managerial* group, which is in the second position, mentions 'experienced professionals'.

All the items in the first four places attained a mean score above four points and revolve around the 'expertise' that can only be found outside the organisation, and how this factor can contribute to the project and organisation.

Table 9.3 Results of part 1 of the close-ended questionnaire - Reasons to outsource in descending order of importance

No.*	Reasons for using IT Outsourcing in an ERP Project	Mean	N	Group of reasons
1	Acquire expertise not available in-house	4.38	72	Technology
2	To employ experienced professional manpower to manage the ERP project	4.32	72	Managerial
3	To get to know the common defects and previous experience of how to solve them	4.25	72	Technology
3	Reduce time – expert outsider can complete the job faster than in-house team	4.25	72	Economic
5	Swifter response to achieve organisational and strategic objectives	4.14	72	Strategic
6	To access and implement new technology	4.13	72	Technology
7	To access best-practice capabilities, to develop strategic systems	4.1	72	Strategic
7	Increased probability to construct stable information system	4.1	72	Technology
9	To get a commitment to timetable, products and a pre-defined and closed budget.	4.01	72	Managerial
10	So that the organisation can be exposed to new strategies, disciplines or services	3.99	71	Strategic
11	Correct implementation with minimum customisation and deviations from standard	3.96	72	Technology
12	Accumulate knowledge and experience for the in-house staff concerning way that the new system is developed and operates	3.94	72	Managerial
13	Overcoming the difficulty in recruiting and maintaining IT professionals	3.93	72	Organisational

No.*	Reasons for using IT Outsourcing in an ERP Project	Mean	N	Group of reasons
14	Improve efficiency and performances with a flexible development process	3.88	72	Managerial
15	To enable the organisation to focus on or allocate resources to core business issues	3.86	72	Strategic
16	Introduce external viewpoints and disciplines into the organisation	3.67	72	Managerial
17	Improve customer service (both intra- and extra-organisation)	3.66	71	Strategic
18	To cope with deficiencies of in-house staff	3.58	72	Organisational
19	Facilitate and simplify performance of changes in the organisation	3.57	72	Organisational
20	To reduce ERP project development costs	3.52	71	Economic
21	Add more personnel to fill a need for short-term, part-time or temporary efforts	3.5	72	Organisational
22	Be more market competitive	3.48	71	Strategic
23	Avoid increase in in-house work force	3.46	72	Economic
24	To maintaining and update organisational knowledge assets	3.38	71	Strategic
25	Flexible budgeting of the project	3.33	72	Economic
26	To enable optimal utilisation of in-house staff	3.29	72	Managerial
27	To maintain more stable in-house staffing levels	3.28	72	Organisational
28	Rationalise expenses: Transforming a capital investment (in-house staff wages) into operational expenses for external staff	3.01	72	Economic
29	To reduce number of direct employees	3	72	Organisational
30	Share or reduce risks by sharing with external entity (fines for non-compliance with goals)	2.78	72	Economic
31	Ability to impose penalties for non-performance / non-compliance with goals	2.65	72	Managerial

* Note: Sometimes more than one indicator is positioned at a particular position due to the fact that they had equal mean values.

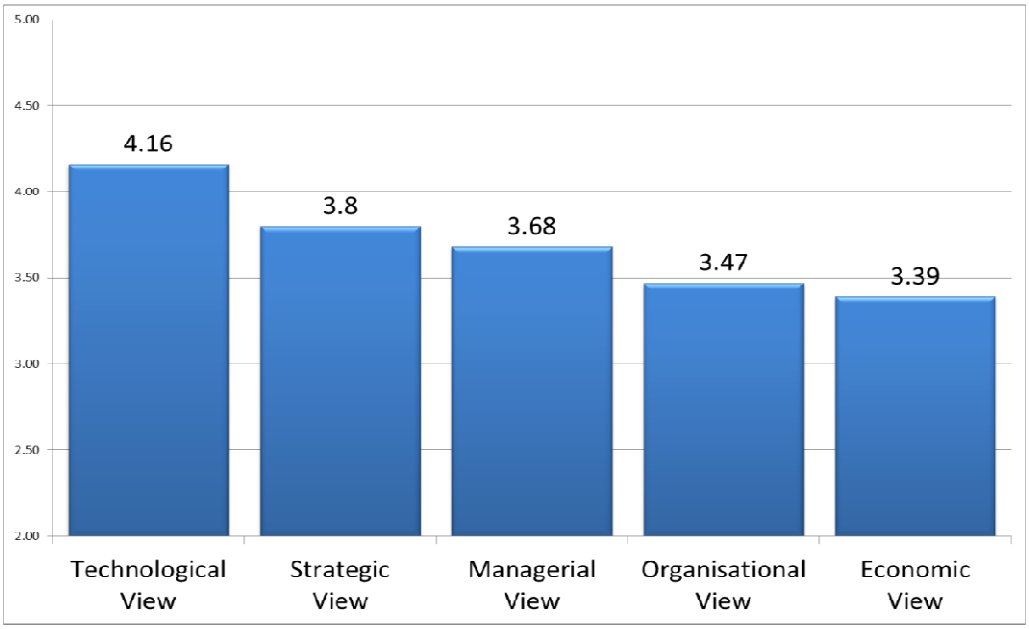
Reasons by groups**:** When the mean number of points was calculated at the group level, it was again evident that *Technology* was seen as the most important group. The *Strategic* group was positioned in second place, and the least important was the *Economic* group. The following table, Table 9.4 presents the ranking of the reasons

at the group level, according to group and Figure 9.1 shows the same data in graphic form.

Table 9.4: Results of part 1 of the close-ended questionnaire - Groups of reasons to outsource in descending order of importance

Groups of reasons for using IT Outsourcing in an ERP Project	Mean
Technological View	4.16
Strategic View	3.80
Managerial View	3.68
Organisational View	3.47
Economic View	3.39

Figure 9.1: Results of part 1 of the close-ended questionnaire - Groups of reasons to outsource in descending order of importance



The histogram shown in Figure 9.1 above yielded the following direction and magnitude: all the components were perceived as important, since no component was considered as 'not important'. The highest score for the group level was 4.16 (the highest score for item-indicator was 4.38). The lowest score for the group level was 3.39 (the lowest score for item-indicator was 2.65). The 0.77 difference between the highest score (Technology group) and the lowest score (Economic group) indicates

to what extent *Technology* and the ability to close expertise gaps are important considerations when choosing to employ IT Outsourcing especially in ERP projects.

All groups of indicators were awarded a high level of importance as they all passed the mean point of three, which is expressive. This suggests that the indicators which were derived from the analysis of the results of the semi-structured interviews and open-ended questionnaires in Stage One do indeed have a general tendency to produce a high rate of importance for the groups.

A Pearson Correlation Coefficients test was used in order to reveal the systematic proximity between the variables, and to measure the correlation between the attributed indicators in detail (See Appendix 9.4) and the correlations between the different groups of indicators. The Pearson r, also called linear or product-moment correlation is the most widely-used type of correlation coefficients, it determines the extent to which values of the two variables are 'proportional' to each other, and was found suitable for the data analysis in Stage Two. Correlations are defined as relationships between two or more variables or sets of variables (Cohen and Cohen, 1983). They relate to three fundamental dimensions: significance, direction, and magnitude. The correlations differ with respect to the number and kinds of variables whose relationship is being studied. Intra-group analysis was employed for each group in order to diagnose the components' rating importance, and statistical significance within this rating.

Using correlation tests between the variables in the analysis process reveals clusters of variables that behave in a similar way and others that behave differently one from the other. As noted above, the detailed analysis of the Pearson correlation coefficient for all the components-indicators is presented in Appendix 9.2. Table 9.5 below presents the Pearson Correlation Coefficients for the groups of reasons to use IT Outsourcing in ERP projects.

All categories showed a good level of correlation (significance less than 0.009) except the *Strategic* and the *Organisational* groups (significance = +0.1566), which can be explained since the *Strategic g*roup deals with the organisation as one entity in the industry and markets, and the *Organisational* group deals more with internal aspects. This means that the results for the degree of the relationship between the

categories attained a level of significance indicating an increased probability that the correlation is a real one and not a chance occurrence.

Table 9.5: Pearson correlation coefficients for groups of reasons (N = 72)

Groups		Organisational	Technological	Managerial	Economic
Strategic	Value	0.16869	0.47292	0.38232	0.40934
	Sig.	0.1566	<.0001	0.0009	0.0004
Economic	Value	0.51998	0.43072	0.64275	
	Sig.	<.0001	0.0002	<.0001	
Managerial	Value	0.49774	0.57179		
	Sig.	<.0001	<.0001		
Technological	Value	0.47064			
	Sig.	<.0001			

Although the following comparison with the literature on the studied issue would perhaps be more appropriate for the discussion of the results in Chapter 10, it is presented here together with Table 9.5 in order to allow the reader to view the necessary evidence for the comparison. These results may be compared to the results of prior studies in this field such as Seddon, Cullen and Willcocks (2002) that tested whether Domberger's Theory of "The Contracting Organisation" applies in an IT context. Domberg's four types of benefit of contracting out service provision: specialisation, market discipline, flexibility, and cost saving emerged as a concise summary of senior IT managers' explanations of why their organisations chose to outsource IT. His findings indicated that after controlling for other factors that affected costs, organisations that contracted out service provision were able to save about 20% of the cost without a drop in service quality. The study of Seddon et al. (2002) concluded that, Domberger's work does indeed provide a very useful explanation of benefits of IT Outsourcing. I therefore compared their results with the results of the present study using the Spearman Correlation test (using an approach and measuring scales from a different type of methodology). Spearman's Rank Correlation Coefficient is used to discover the strength of a link between two sets of data, and the calculation, resembles the calculation for Pearson correlation, but is carried out on the ranks of the data. Using ranks eliminates the sensitivity of the correlation test to the function linking the pairs of values (Kendall and Stuart, 1973).

The sets of data that were compared included the 17 identical components that appeared both in this research and in the previous study. (The sourced data numbers appear in Appendix 9.3). This non-parametric test was conducted in order to compensate for the differences between the different methodologies of the two research studies.

The Spearman Correlation Coefficients test (compatible in both studies - N = 17, using equivalent indicators, see Appendix 9.6) indicate high similarity between the two sets of results (Seddon et al., 2002 and the present study) although the test of Seddon et al. did not consider ERP in particular: a high correlation value of 0.64825 was demonstrated with significance 0.0049 between the two compared sources.

The second part of the close-ended questionnaire - Success factors:

In the second part of the questionnaire, the respondents were asked to indicate which factors they felt had a significant influence on the success of an ERP project using IT Outsourcing (on a Likert scale of 5).These factors were measured by calculation of the mean value for each item and the results were organised in descending order of importance in the following table, Table 9.6. The relevant group category of each indicator is also presented in the table.

Table 9.6: Results of part 2 of the questionnaire – Level of importance of different success factors in descending order

No.*	Success Factors	Mean	N	Group of Success Factors
1	Commitment, involvement and endorsement by the organisation's management	4.72	72	Top management
2	Choice of vendor with strong managerial and professional experience, introduction of change	4.60	72	Selection of vendor and contract
3	Tight cooperation between vendor and client	4.58	72	Working with vendor
4	Learning from the vendor's sophisticated management and technological tools	4.54	70	Strategic and organisational
5	Overcoming resistance within the organisation before the project begins	4.45	72	Strategic and organisational
6	Pre-determination of logical timetable for project performance	4.41	71	Selection of vendor and contract
7	Ensuring a high level of consultants in important positions (management, architecture, and implementation).	4.39	71	Selection of vendor and contract
8	Construction of set-up with decision-making mechanisms	4.37	71	Working with vendor
9	Providing the vendor's employees with an empowered sense of identification	4.35	71	Working with vendor
10	Close escorting of the organisation juniors by external consultants	4.24	72	Working with vendor
11	Agreement with the vendor concerning contents at the specification stage	4.23	71	Selection of vendor and contract
12	Definition of goals and methodical planning of the project.	4.21	72	Top management
12	Flexibility in handling of consultants and the external companies for better control and supervision	4.21	71	Working with vendor
14	Examination of the vendor's ability to comply with professional and managerial commitments.	4.17	72	Selection of vendor and contract
15	Constructing a combined balanced team from the external and internal manpower	4.08	71	Strategic and organisational
16	Creation of common vendor-client approach (WIN-WIN)	4.07	71	Working with vendor

No.*	Success Factors	Mean	N	Group of Success Factors
17	Vendor's stipulation to ensure fair and proper work conditions for his employees	4.03	70	Working with vendor
17	Reducing the extent of dependence on the external vendor	4.03	72	Strategic and organisational
19	Treatment of information security within the organisation	4.01	72	Strategic and organisational
20	Vendor's undertaking for stable staff during project	3.85	71	Selection of vendor and contract
21	Preference for a vendor with prior knowledge of the customer's systems	3.69	70	Selection of vendor and contract
22	Assimilation of the vendor within the organisation's culture	3.66	70	Working with vendor
23	Effective management of 'surprises' and unanticipated incidents	3.65	69	Working with vendor
24	Taking care to maintain the knowledge within the organisation	3.63	72	Strategic and organisational
25	Lucid contract clearly defining vendor-client obligations	3.59	71	Selection of vendor and contract
26	Vendor works according to systematic methodology of project management	3.56	70	Working with vendor
27	Construction of mechanism for supervision and control of progress	3.54	70	Working with vendor
28	Professional treatment of the technical infrastructure and materials	3.52	71	Strategic and organisational
29	Correct calculation of hidden costs in advance	3.46	69	Working with vendor
30	Definition of detailed work plan for the vendor	3.43	70	Selection of vendor and contract
30	Vendor undertakes to conduct training of replacements, guidance and instruction	3.43	70	Working with vendor
32	Adding external independent consultants to ERP project manager	3.32	69	Working with vendor
33	Alterations of contents and work conditions coordinated with vendor	2.91	70	Selection of vendor and contract

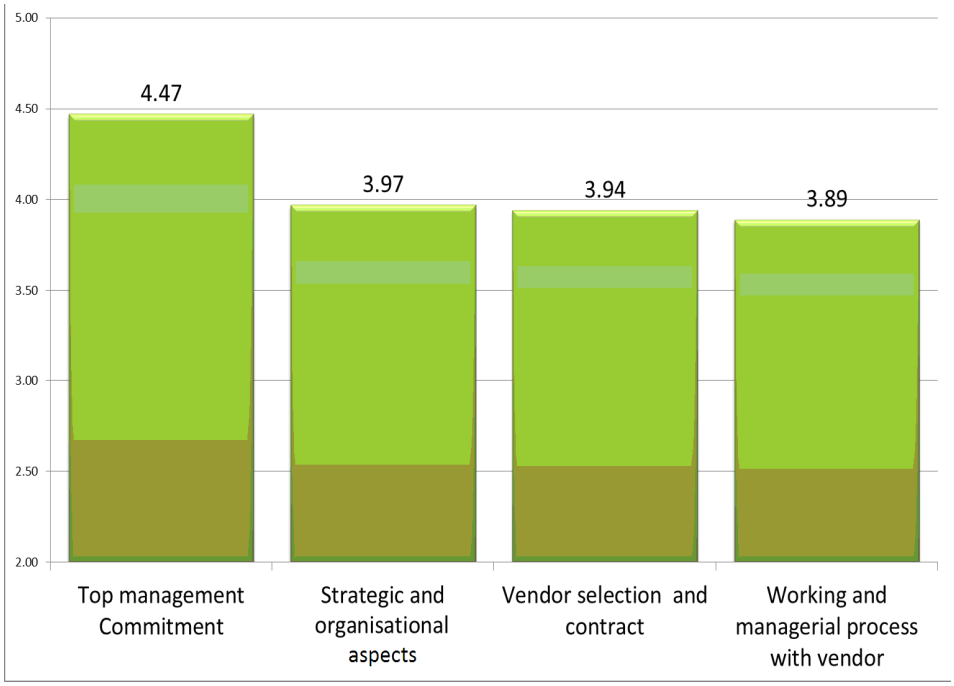
* Note: Sometimes more than one indicator is positioned at a particular position due to the fact that they had equal mean values.

Table 9.7 below presents the groups of success factors ranked according to descending extent of importance and Figure 9.2 illustrates the same information in graphic form. All groups of success factors that appear in the questionnaire attained high scores - *Top management attitude and commitment* was highest on the list with a considerable gap of 0.5 points from the other groups that all attained nearly 4. This critical importance of *Top management attitude and commitment* resembles the research findings of Somers and Nelson (2001) presented in their classification of: "*The mean rankings of Critical Success Factors by degree of importance in ERP implementation*", listing 'top management support' in first place with a mean value of 4.29 (on a scale of 1-5). It is however noted that the present finding differs slightly from that of Somers and Nelson because the factor *Top management attitude and commitment* used here included the correct usage of an external workforce (IT Outsourcing) a matter that was not considered by Somers and Nelson.

Table 9.7: Groups of success factors by descending mean rate of importance

Success Factors- Extent of the Importance by Groups	**Mean**
Top management attitude and commitment	4.47
Strategic and organisational aspects	3.97
Selection of vendor and contract	3.94
Working and managerial process with vendor	3.89

Figure 9.2: Groups of success factors by descending rate of importance



9.2.2 Inter-correlation of success factors

In order to understand whether and to what extent there was a correlation between the different groups of success factors, Pearson correlation coefficients were calculated between the different groups. The results appear in Table 9.8 below. According to this table, it is only the "*Top management attitude and commitment*" group that does not show any correlation with the other three groups. This result is not surprising if it is understood that top management involvement is essential in any case, no matter what other influences may exist. As Gray (2004, p.265) indicated: *…the most exciting project idea is worthless if it can't be successfully implemented. A major factor in this will be the amount of high-level political support the proposal enjoys. It may sound defeatist to advise that unless senior people are genuinely enthusiastic about the proposal ~ which means they are prepared to spend significant amounts of their own time monitoring and supporting it ~ it's probably not worth doing, but this will almost inevitably turn out to be the case.*

Table 9.8: Pearson correlation coefficients showing correlation between different groups of success factors (N =7)

Groups of success factors		Strategic and organisational	Working and managerial process with vendor	Selection of vendor and contract
Top management commitment	Value	0.06085	0.10951	0.16017
	Sig.	0.6116	0.3598	0.1789
Selection of vendor and contract	Value	0.64354	0.59668	
	Sig.	<.0001	<.0001	
Working and managerial process with vendor	Value	0.62336		
	Sig.	<.0001		

The extent to which the factor was expressed in the project:

The questions in part two of the questionnaire investigated the extent to which the success factors were expressed in practice in the project that the respondent had experienced i.e. to what extent (%) the outsourcing in the ERP project realised prior expectations. Table 9.9 below compares the respondents' mean ratings for each group of success factors.

A comparison between the respondents' ratings for the success factor's notional importance, with their ratings for the extent to which they perceived that the factor was actually considered/expressed in practice in the project that they experienced shows a consistent gap between the two groups of factors (notional and actual). In general ratings for the extent to which the factor was expressed in practice were lower, but the proportional ratio between the groups was still kept (to exemplify the correlations, the detailed results for all factors are presented in Appendix 9.5). Although respondents tended to give almost the same points (around 3.5) to their post-project evaluations of the factor as for evaluations of the notional value of the

factor, however, in general their post-project perception was lower. In other words: although the respondents thought that a particular factor was theoretically expected to be important, in practice in their experience of the actual implementation of the ERP project with the assistance of the IT Outsourcers, the factor was not found to be so important. This differential between the two perceptions was consistent for all factors. Nevertheless a noteworthy level of importance was perceived for all the factors at both stages.

Table 9.9: Comparison of perceptions of notional importance of success factors with perceptions of actual importance of success factors in practice

Groups of Success Factors	Mean notional Importance	Mean Importance in Practice	Gap
Top management Commitment	4.47	3.50	0.97
Strategic and organisational views	3.97	3.56	0.41
Selection of vendor and contract	3.94	3.56	0.38
Working and managerial process with vendor	3.89	3.57	0.32

The third part of the close-ended questionnaire:

The third part of the questionnaire asked the respondents to evaluate their experience, based on the results achieved in their own ERP projects: "*To what extent (%) did the IT Outsourcing in the ERP project realise expectations*?" Respondents were asked to answer this question in relation to each of four groups of reasons: *Technological, Organisational, Strategic*, and *Economic*. Total evaluations for each group are presented below in figure 9.4, indicating that the respondents estimated that the ERP projects achieved over 60% of the pre-project expectations. The highest score was given to the *Technology* group, indicating that expectations for this aspect of the project were met to a greater extent than expectations for other aspects. This corroborates the previous findings from part 1 of the questionnaire (presented in Table 9.4: Results of part 1 of the close-ended questionnaire - Groups of reasons to outsource in descending order of importance).

Figure 9.3: Perceptions of the extent to which expectations for the ERP project were realised in practice using IT Outsourcing (percentages)

Part 3 of the questionnaire also included closed-ended Yes/No questions, in order to acquire short and clear information about the necessity of IT Outsourcing in ERP projects.

Examples of questions and the responses: "*Did the outsourcing really reduce development costs in the ERP project?*" - 85 % of the respondents answered No, and when they were asked the same question in relation to "non- ERP projects" - 60 % answered Yes. Another important question was: "*Is it possible to succeed in an ERP project without the assistance of outsourcing*?" which received a strong negative response by over 95 % of the respondents.

9.3 Summary

This chapter offered an analysis of the qualitative and quantitative findings gathered to respond to the research questions regarding the implementation and maintenance of ERP projects with the assistance of IT Outsourcing in Israel, as they emerged from the open-ended questionnaire, from the semi-structured interviews, and from the close-ended questionnaire. The next chapters discuss these findings in relation to previous findings and theories in the relevant fields of knowledge.

Section 6: Discussion

Preview

This section presents the interpretation and evaluation of my findings. It offers an integration of the main results that emerged from the open-ended questionnaire, from the semi-structured interviews, and from the closed-ended questionnaire, considered in the light of previous research and theory on the studied issues. The discussion aims to elucidate the relationship between IT Outsourcing and ERP projects, providing evidence to answer the main research question, identifying the success factors for the implementation and maintenance of ERP projects with the assistance of IT Outsourcing in Israel. This evaluation of the findings supports what appears to be an innovative perception on the relationship between IT Outsourcing and ERP, developing the foundations of an argument that will form the basis for the conclusions in the next section.

The first chapter in this section offers an overview of the results, and then interprets the findings, indicating their alignment with existing knowledge. Reference to extant theoretical perspectives which underpin the conceptual framework of this research is used to support and to distinguish the interpretations and evaluations of the emergent data. The second chapter describes the success factors of IT Outsourcing in ERP projects in Israel as they were identified in this research, and suggests appropriate strategies to enable organisations to meet their IT and business targets.

Chapter 10 – Discussion

This chapter discusses the findings of the research process, triangulating the findings from the different stages and comparing them with previous findings described in the literature. The high degree of agreement, or corroboration, between these sources allows for confident interpretation of their significance, which is addressed for each factor individually.

10.1 Qualitative findings

The following discussion relates to the themes and issues derived from the qualitative findings that emerged from the open-ended questionnaire and the semi-structured interviews in Stage One. The findings are discussed in the light of existing knowledge and perceptions concerning the effectiveness of IT Outsourcing, including different motivations for IT Outsourcing and literature relating to ERP projects, and suggests a list of possible success factors to be tested in the next quantitative stage.

The results of the open-ended questionnaire and the semi-structured interviews administered in Stage One were analysed separately. It was found that both sets of data mostly corresponded with existing knowledge in this field. However new observations that emerged from the data regarding the relationship between IT Outsourcing and ERP, such as 'ERP projects necessitate IT Outsourcing' may provide new knowledge that has not been considered in the literature. The results were reinforced by triangulation of the different types of data, comparing the output of the content analysis of these two methods, yielding common, supportive and complementing themes and issues. These themes and issues are now discussed in greater detail.

The framework for the discussion relates to the data gathered from the two research stages, for each group of data and then discusses the details of each group of data separately. Analysis at these two levels contributes to a comprehensive understanding of the effectiveness of IT Outsourcing in ERP projects.

Five main issues emerged from the content analysis of the semi-structured interviews (percentages given here relate to the prevalence of these issues in the transcriptions):

1. The different motivations for use of IT Outsourcing (37.42%)
2. Success factors for an IT Outsourcing project (34.36%)
3. The critical impact of ERP success or failure for an organisation's performance (12.88%)
4. The Organisation-Vendor relationship (10.43%)
5. Problems involved in the use of outsourcing in an ERP project (4.91%).

10.1.1 The different motivations for use of IT Outsourcing

Four main issues reflected the interviewees' views on motivation to use IT Outsourcing: 1) the need to close the gap in skills and experience, 2) ERP projects necessitate IT Outsourcing, 3) outsourcing facilitates operational flexibility, and 4) superior quality of the development process.

The interviewees indicated several reasons for their decision to use outsourcing; a most explicit answer was provided by one of the participants who said: *"I wouldn't recommend anyone to do that* [i.e. not to use outsourcing] *(in an ERP project) ... would even consider whether just one outsourcing vendor is sufficient"*. This statement and others like it indicated that there was a clear understanding that closing the gap in skills and experience was an important motivator for outsourcing. Benefits such as flexibility, and superior quality, were seen as significant advantages, justifying the use of outsourcing for any organisation.

10.1.2 Success factors for an IT Outsourcing project

The interviewees mentioned certain internal organisational characteristics as possible success factors for the success of the project such as: Management's commitment, Leadership, Managerial change, Control and collaboration, Planning, Good decision-making mechanism, Business Culture, and also noted characteristics of the organisation's relations with external entities as possible success factors such as: A good contract with vendor, and Good reciprocal relations between the project's participants. These characteristics emerged from responses such as the following detailed answer:

> *If the integration of an ERP project is managed properly this can have an extremely* [positive] *influence. This could be achieved by gathering a collection of "stars", like in a football team, but if those stars cannot communicate with*

one another, they cannot deliver as a group. They should form a good relationship, and then perform according to a solid methodology and under a good integrated management. A manager simply has to ask the right questions in the right place, and put his capable people in the right direction".

The other three issues reflected in minor rates of comments relate to various facets of the organisation and to the ERP project implementation.

10.1.3 The critical impact of ERP success or failure on an organisation's performance

Responses relating to this issue stressed that failure to develop and implement the ERP project successfully might lead to disastrous results for the organisation. The implication from this perception is that organisations are obliged to employ the best experts available in the market, naturally from outside the organisation (since the organisation does not have the ability to train, up-date and equip such experts), even though this strategy necessitates significant investment of resources. Statements that related to this theme included:

ERP constitutes a large part of the integration process and influences the successful delivery of the project. The effective management of the integration of an ERP project is extremely influential … Management of risks is enormously important. We discuss this with each person in the organisation. ...failure can cause halt [the operation] *of the organisation ... It is very critical for us.*

10.1.4 The Organisation-Vendor relationship

Responses relating to this issue related to the contract with the vendor and the need to obtain knowledge from the vendor that the organisation lacks. Examples include:

The contract should be fair for both sides because it also has to be beneficial for the vendor

Good communication and understanding between the organisation and the vendors' team is highly significant.

It is recommended that the contract with the vendor should include an option to directly employ members of their staff, who have already had experience with our organisation and related business processes.

The above responses clearly indicate the importance of the relationship between the organisation and the vendor. Appropriate working relations, official and unofficial, are required throughout the life cycle of the project. This means that a fair and clear contract established on a good base of understanding ("Win-Win" strategy), and effective open communication will contribute to the success of the project and produce mutual benefits.

10.1.5 Problems involved in the use of outsourcing in an ERP project

The responses in this category related to the problems and costs that might be involved in the employment of IT Outsourcing for the implementation of the ERP project, and the subsequent need for the preservation of knowledge after the project is finished. One of the many responses referring to the problems was:

> *Actually I face two kinds of problems: first, not all the jobs in our organisation are interesting or challenging, for the IT* [outsourcing] *employee, but it is preferable to employ them internally and for a long time. Because of the need to retain people with the necessary organisational knowledge, having an external work force seems to be problematic in the long run. In other organisations I know they work* [with a strategy] *exactly the opposite from mine and hold very few people for maintenance. Most of their projects are performed by an external vendor, and projects can take a year, two years, and even more time. Our organisational structure does not permit us to operate without a critical base of knowledge and simply "freeze" the organisation. Then I have to look again for the most talented outsourcing expert that exist, and again teach* [this new person] *the business knowledge.*

According to this response, the respondent considers three alternative strategies and he is aware of the problems that each of them poses for the organisation: (1) Using an internal force to compete with most of development and maintenance work (2) Short term ad-hoc IT Outsourcing and (3) Long-term IT Outsourcing.

He regards IT Outsourcing as a must in critical and complex ERP projects but he fears the loss of the business and technology knowledge accumulated before and during the project when the external experts leave the organisation. Consequently, he prefers to retain the outsourcing workers for a long term, and later on to absorb them within the organisation. This policy may also solve the second mentioned problem of

leaving the dull maintenance work for the pre-existing internal force, after the external IT Outsourcing workers complete the development.

The results of the semi-structured interviews were then triangulated with the results of the open-ended questionnaire, indicating strong support for the reciprocal relations between IT Outsourcing and ERP. Most of the interviewees indicated that an "ERP project necessitates IT Outsourcing", while the respondents of the open-ended questionnaire indicated that they were "not familiar with" other organisations who had implemented an ERP system without using any kind of IT Outsourcing.

The other results of the open-ended questionnaire were presented in Chapter 9 in Table 9.1, rating the emergent themes in descending order of prevalence in the texts. These themes are sorted and presented here by their relative importance (as ranked by the respondents on a scale of 1-27) within the five categories represented in the questionnaire: *Strategic, Economic, Technological, Managerial and Organisational*, and *Relations with IT Outsourcing vendors*. Each theme was assigned as appropriate to one of the five issues identified in the findings of the semi-structured interviews. As little research is found in the literature that relates to the relations between both phenomena (IT Outsourcing and ERP), the findings yielded by the qualitative data were interpreted by referring to the existing literature on IT Outsourcing in general and also to the existing literature relating to ERP.

The following discussion is arranged according to the five underpinning categories of the questionnaire. Detailed consideration is given to the categories' constituent themes.

The output of this analytic process produced a list of motivations for the use of IT Outsourcing in ERP projects. This list informed the construction of Part 1 of the close-ended questionnaire employed in Stage Two of the research. This first part of the close-ended questionnaire tested the level of importance of each motivation. The list of these motivations is presented according to the respondents' perceptions of their level of importance. Part 2 of the questionnaire tested a corresponding list of success factors. The results of this part of the questionnaire are presented in line with the categories and constituent themes that emerged from the qualitative data (from the open questionnaire and interviews).

10.2 Categories of Themes that emerged from the Qualitative Data

CATEGORY 1: TECHNOLOGY

Theme A: ***Gap in knowledge and experience***

Relative importance rating: 1

Mean rate of frequencies: 2.73

Compatible issue in semi-structured interviews: ***The different motivations for the use of IT Outsourcing***

There was a wide consensus among the respondents that the issue that most powerfully influences organisations to use IT Outsourcing in ERP projects is the need for knowledge and experience that does not exist in the organisation.

This theme is less significant when IT Outsourcing is employed for legacy systems, where knowledge of the software is specific to the organisation's own application. In such a case, it is usually the in-house IT department employees, who are the experts that know and control and often actually wrote their organisation's IT procedures, so that external support power has to learn and adjust to the internal working environment and therefore has no competitive advantage. On the other hand, ERP systems are standard packages usually produced for a mass market. They are very complicated and need a common familiarity with implementation in other organisations and sites, which usually does not exist in the organisation. Samples of responses relating to this theme include:

> *Experts cannot be found internally or trained up in-house*,
>
> [Outside experts] *gain knowledge of common defects and their proven solutions,*
>
> *We need access to specific IT skills and services.*

The challenge to succeed in performing ERP projects, and the deep understanding that the organisation often has a critical lack of knowledge and experience, was expressed clearly in the respondents' answers:

The complexity of the system and the project – [points up a] *lack of internal professional knowledge, lack of experience in leading such projects.*

Our motivation was to use reliable manpower in order to get technical and applicative information, training and building an integrated team which would allow us comply in time to market needs, while at the same time maintaining quality and preventing failures due to "first time" implementation.

Or as one respondent remarked:

One of the most important factors for success is to choose the suitable consultants [since] *they know the common problems and how to solve them.*

Respondents ranked the "*Gap in knowledge and experience*" as the most influential theme. This would indicate that knowledge and experience are critical for the success of the ERP project, which in its turn is crucially important for the future of the organisation itself. This theme's conceptualisation is supported by ample evidence in the literature, mostly in research on ERP, such as the studies by Harrell et al. (2001); Hong and Kim (2002), and Al-Mashari et al. (2003). Somers and Nelson (2003) assert that the complexity involved in implementing an ERP system requires the use of either internal or external experts who are knowledgeable about the installation and software. Poppo and Zenger (1998) claim that organisations will outsource IT functions, to the extent that demands for personnel with extensive knowledge and skills are more comprehensive.

Other research on IT Outsourcing also supports the significance of this theme. According to Wang, Gwebu, Wang and Zhu, (2008), some organisations outsource in order to gain leverage in a vendor's specialised area of expertise, knowledge concerning a particular system, technology or process. This may be the fastest and most efficient way for organisations to gain access to these skills. According to Kern et al. (2002) the technological aspect of IT Outsourcing consists of improving the quality of IT and gaining access to new and/or proprietary technology.

Theme B: ***Drawbacks of ERP Implementation***

Relative importance rating: 6

Mean rate of frequencies: 1.87

Compatible issue in semi-structured interviews: ***The critical impact of ERP success or failure on the organisation's performance***

Many of the respondents related to this theme, ranking it high in the list, indicating that possible difficulties and risks should be seriously considered when implementing cross-organisation systems such as ERP. This finding was referred to as follows:

> *Actually we had to change some of our plans during the implementation as the interface with the standard software did not work,*
>
> *We have encountered a few integration problems that caused us to lose some of the promised functionality,*
>
> *Some customisation problems were only exposed at the end of the project by the users, and because of the complexity of the implementation, it was too hard to reconstruct,*
>
> *Fixing one problem may cause others because of the integrative attribute of ERP.*

This perception is consistent with the view of Pozzebon (2000), who claimed that ERP implementation is a significant intervention in organisational life. ERP vendors and consultants consider that ERP embodies the best universally applicable business processes; however, there is no consideration for potential clients' cultural distinctiveness. Because of the designer's focus on core competence, low cost strategies and mass production, ERP appears to reflect a universalistic culture (Skok and Legge, 2001). However, lack of cultural congruency can lead to cultural gaps and can contribute to ERP failure. Allen and Kern (2001) identified two main sets of culture in ERP development, implementation and use. On the one hand, there is a culture embedded in the ERP software reflecting the views of the ERP developers, vendors and consultants. A second type of culture reflects the views of the implementing organisation’s project team, managers and users.

As already noted, the implementation of an ERP system is a very time-consuming, expensive and arduous task (Michel, 1997), moreover due to their universal nature

ERP systems force their customers to re-engineer current practices to fit within the processes described by their modules. Hecht (1997) stresses that selecting the wrong ERP software could result in an unwilling commitment to information architecture and applications that do not fit in with the organisation's global strategic goals.

Theme C: *Tools and packages*

Relative importance rating: 10

Mean rate of frequencies: 1.73

Compatible issue in semi-structured interviews: ***Organisation - Vendor relationship***

Respondents ranked this theme as tenth in order of importance. They noted that

> *The chosen vendor was expected to use better development tools,*
>
> [ERP vendors provide] *experienced and proven frameworks,*
>
> *We looked for strong knowledge in order to increase standardisation in technologies used,*
>
> [The tools and methods suggested by the IT Outsourcing vendor provided] *the best way to integrate the ERP system with other systems.*

Respondents indicated that they highly respected the knowledge and the experience of the vendors and the development tools and proven frameworks which they used in the current project for the benefit of the organisation. This motivation is also supported by the assertion of Chau (1995) that a significant attraction of packages for many organisations is related to the relative advantages of implementing what is seen as a "tried and tested solution". Ondo and Smith (2006) argued that vendors have access to better resources, facilities and expertise that enable them to deliver better and more capabilities than the organisation's in-house capabilities. Experienced consultants can provide excellent information on all available packages in the marketplace; the latest functionality available in the most common packages and, most importantly, they can assist the user in deciding whether a specific requirement would provide added value for the user and the organisation. Sawyer (2001) even contended that the lengthy lag between a user's requests for a new system and implementation has been replaced by market-based approaches so that software vendors can produce new releases faster than the consumers can absorb them.

Theme D*: ERP is package-based generic enterprise software*

Relative importance rating: 20

Mean rate of frequencies: 0.80

Compatible issue in semi-structured interviews: ***The critical impact of ERP success or failure on the organisation performance***

This theme was derived from the following remarks:

To work with a standard package-based software,

To gain an advantage from integration,

One data-base,

The process of implementing a standard system is a good opportunity to check our business.

Although ratings for this theme were not high, it represents a significant change in organisations' consideration of their IT systems, as the decision to use a standard system instead of a custom-made system, necessitates new considerations regarding the necessary skills, new implementing procedures, handling of specific organisational processes, using industrial solutions, and adopting best practices.

According to Hill (2000), ERP incorporates all the elements of a business, from financial processes to manufacturing and marketing activities, merged into a unified whole that operates more effectively and efficiently in today's competitive economy. This concept was supplemented by Davenport (2000b), who explained that most ERP systems start with a set of core modules, and offer additional modules from which an organisation can select as desired. When all these applications are fully integrated, they can provide consistency and visibility for all activities across the entire operation system.

Similarly, Willcocks and Sykes (2003) pointed out, that ERP packages require a mix of old and new skills and a "whole organisation" set of packages that necessitate large scale business process re-engineering; an appropriate degree of customisation; and integrated software. The primary function of ERP systems is the integration and standardisation of information and processes within the internal organisation and throughout its supply chain (Davenport, 2000b). They offer the necessary resources

for the implementation of a common database for everyone's use in real-time, since the central database integrates information enabling the organisation to be truly accessible to everyone across diverse organisational functions, units, and geographic boundaries (Dillard and Yuthas, 2006).

Theme E: ***Adequate ERP implementation strategy***

Relative importance rating: 24

Mean rate of frequencies: 0.53

Compatible issue in semi-structured interviews: ***Success factors***

This theme was derived from comments such as the following:

> *ERP project is a very complex project which requires an integration of infrastructures, application and knowledge. Skilled Project managers can be a great help in project managing along with its success,*
>
> *Standardisation was a main reason for us to purchase the ERP package,*
>
> *[ERP systems] comply with 'industrial standard' practices,*
>
> [ERP systems represent] *synergy.*

The above responses show that the respondents understand the importance of compliance with industrial standards that an ERP system imposes on the organisation. Also, the complexity of the implementation process can be resolved with the help of the knowledge and the experience of skilled project managers (usually gained in participation in many previous projects). Davenport (2000a), suggested that ERP systems can either be implemented in a slow or in a fast mode, depending on how ambitious the organisation's goals are, how pressing deadlines are, and how well implementation proceeds. A fast implementation can take as little as six months; a slow one can take up to five years or more. Implementation of an ERP system and the affiliated business change can be handled in many different ways. Groth (1999) maintained that ERP systems bring their own business processes and work method to the organisation, which can subsequently adopt these so called "best practices" (Swan et al. 1999).

A study by Markus et al. (2000) showed that many problems involved in ERP implementation were caused by a misfit of the system with the organisations' unique characteristics. Mismatch between the organisation's culture and that of the ERP system was already indicated as a disadvantage above. Davenport (2000a) amplified this assertion, explaining that ERP tends to impose its own logic on an organisation's strategy, and/or culture, which may or may not fit existing organisational arrangements. Thus, ERP implementation can be viewed as an organisational change process, rather than merely the replacement of a piece of technology. This is not just a technological solution but also necessitates the adjustment of the organisational processes and the functionality of the system so that users will be able and ready to work with it. Respondents indicated that preference for a particular system should be agreed with the users from the project's inception and this should minimise any resistance.

Theme F: ***Desire to replace the aging IT architecture or technology***

Relative importance rating: 26

Mean rate of frequencies: 0.40

Compatible issue in semi-structured interviews: ***Motivation for the use of IT Outsourcing***

This theme was rated as the penultimate item in the list of themes. The rationale behind ERP system implementation is often to replace legacy systems built on out-dated technologies and to externalise system development and maintenance and standardise their IT environment (Ross and Vitale, 2000). This rationale underlies the implementation of ERP systems in organisations in mature economies (Mabert, Soni and Venkataramanan, 2000).

This theme was referred to as follows:

> *The systems that we used in our organisation ran on mainframe and limited* [our ability to cope] *with new marketing requirements; hence the decision was made to adopt a modern ERP system and to abandon the old mainframe computer.*
>
> [We employed the ERP due to the] *need to renew an old system*,

The old system used obsolete technologies, the ability to meet increased requirements is critical".

Appropriate business and legacy systems are still important in the initial chartering phase of the project (Roberts and Barrar, 1992). Bingim Sharma and Godla (1999) argued that organisations must choose the desired level of functionality and how to link the ERP system to legacy systems. In addition, to best meet business needs, organisations may integrate other specialised software products with the ERP suite. Interfaces for commercial software applications or legacy systems may need to be developed in-house if they are not available in the market. However, Themistocleous et al. (2002) warn that ERP packages do not seem to be able to "*cover all the business processes of an enterprise*"(p.1088) so that organisations typically do not "*abandon all their existing applications when adopting ERP solutions*" (p.1089). In other words, (a) ERP does not cover all IT requirements; (b) they cannot meet all business processes and (c) according to Korzeniowsky (2000), ERP will never meet them.

Theme G: ***Problems with maintenance of old system***

Relative importance rating: 27

Mean rate of frequencies: 0.2

Compatible issue in semi-structured interviews: ***Motivation for the use of IT Outsourcing***

The lowest rated theme related to the need to care for legacy systems, which are still needed for specific activities or as interfaces. This theme was derived from remarks such as:

We decided not to integrate some specific activities as the old system performs [these functions] *quite well and a new development would not be cost efficient. Still we hope we won't encounter unexpected problems.*

As this remark indicates there is always concern that the old system will not operate as necessary and the knowledge for current maintenance might not be available within the organisation. These old systems use obsolete technologies, but they are not amenable to further development. Warren,(1999) noted that the fact that legacy IT systems are old, out-dated technologies, muddled by years of modification,

degradation and general lack of attention may explain problems associated with getting IT to work.

Qualitative findings for the "Technology" category themes in the open-ended questionnaire were triangulated with quantitative findings from the close-ended questionnaire in Stage Two regarding the motivations for the use of IT Outsourcing in ERP projects. The results appear in Table 10.1 below:

Table 10.1: Triangulation of qualitative results for the 'Technology' category with quantitative results regarding the motivations for the use of IT Outsourcing

Relative importance rating (on a scale of 1-31)	Motivations for the use of IT Outsourcing in ERP projects derived from the "Technology " category
1	To acquire expertise not available in-house
3	Outsourcer server familiar with the common defects and previous experience of how to solve them
6	To access and implement new technology
8	Increased probability to construct stable information system
11	Correct implementation with minimum customisation and deviations from standard

CATEGORY 2: MANAGERIAL AND ORGANISATIONAL CONSIDERATIONS

Theme H: *Operational Issues*

Relative importance rating: 2

Mean rate of frequencies: 2.27

Compatible issue in semi-structured interviews: ***Organisation - Vendor relationship***

This theme was ranked second in order of importance It includes several different concepts: 'Balanced project team', 'Discipline and standardisation', and 'Reduction of the number of direct employees'.

These concepts were derived from the following answers:

> *Using IT Outsourcing was definitely successful. It enabled the construction of a synergetic team, in which all the members performed tasks in accordance with their specific qualifications and strength, and not because of their formal position and the fact that they are members of the organisation or belong to the external vendor,*
>
> *We have established good standards for communications,*
>
> *In the end, using the standards of the ERP package was very beneficial.*

This theme relates to the integration of the IT Outsourcing servers with the organisation's current project resources, including the good relations and harmonious team work that help to contribute to the project's success. Concern for a balanced project team is reflected in the ability to create 'strong' social bonds within the project team, creating a cohesive social unit where knowledge can be freely exchanged and effectively assimilated through members' bridging activity.

Operational issues are mentioned in the relevant literature as follows: Rouse et al. (2001) argued that using IT Outsourcing can help the organisation to optimise the number of direct employees. According to Newell, Tansley and Huang, (2004), the role of a project team, set up to design and implement a large-scope IT system (such as a cross-organisation system as ERP), is essentially to integrate distributed knowledge. Oza and Hall, (2005) suggest that efficient communication tools are needed to help information sharing and communication as there is a lot of information to be exchanged between the organisation and the outsourcing service providers.

Theme I: ***Managerial considerations***

Relative importance rating: 7

Mean rate of frequencies: 1.87

Compatible issue in semi-structured interviews: ***Success factors***

This theme was ranked as one of the first ten themes in the list. It was derived from remarks such as:

> *The project was a great success. All the systems continued to function after getting on air. The reason for that was to achieve professional managing (of outsourcing) and the management commitment at the last stages of the project,*
>
> *Staying within the schedule and budget, overcoming deadlines.*

This finding indicates that the respondents recognised that effective project management is essential for the project's success. This includes planning well-defined tasks, accurate estimation of the required budget, construction of timelines for the project and its control. Management commitment was also considered a main factor for success by the respondents

Many aspects of the issue of ERP project management have been discussed in the literature including the consideration of outsourcing in this context (Kuang et al. 2001; Somers and Nelson, 2001). Rosario (2000) suggested that the first managerial step in such a project should be to clearly define and delimit the scope of the project and how it should be controlled. Details should include the amount of systems to be implemented, involvement of business units, any proposed changes, and the amount of business process reengineering needed. The project should then be formally defined in terms of its milestones, critical paths, coordinated training and active human resources (Holland et al., 1999; Wee, 2000). The escalation of issues and conflicts should be promptly and efficiently managed (Rosario, 2000). According to Power et al. (2004), defining the project plan ensures that the outsourcing strategy is formed into a manageable framework which can be communicated forward to all involved parties. Fjermestad and Saitta (2005) suggest setting up a governance committee to oversee the outsourcing and ensure that IT decisions concerning overall strategies are approved by all significant stakeholders in the organisation.

Additionally, the organisation's self-defined standards and policies can ensure that IT requirements match their particular business requirements (Jennex and Adelakun, 2003).

Theme J: ***Pre-implementation considerations***

Relative importance rating: 12

Mean rate of frequencies: 1.53

Compatible issue in semi-structured interviews: ***Success factors***

This theme relates to pre-implementation factors required to increase the probability of success. It includes the project management's need for clear definition of goals. It also includes methodical planning of the project, commitment and involvement and support of the organisation's top management, successful integration of IT Outsourcing factors and the effective management of expectations. Kern and Willcocks (2002) suggested that a skilled management infrastructure should be established before the outsourcing takes place. Experienced professionals can make the outsourcing process smoother and also help the organisation to prepare better for the outsourcing (Sullivan and Ngwenyama, 2005). In some cases, customer organisations have created new processes and protocols to better manage their relations with the outsourcing provider (Lacity, Hirschheim and Willcocks, 1994). This includes efforts to supervise the development of the project and the external services, by defining the working procedures by themselves before beginning the project, so that all the external participants will know what is expected from them.

Fjermestad and Saitta (2005) indicated that the management of the organisation should support the integration of the project by setting clear objectives and developing the maturity and organisational processes of the joint organisation-outsourcing providers teams, giving outsourcing initiative the same strategic importance as other strategic initiatives, and by overcoming the fears employees have of being replaced and managerial concerns about outsourcing management. They suggest strategies to alleviate these fears and concerns by using communication programmes which can address the impact of outsourcing on in-house employees and help to create cooperation and trust (Parker and Russel, 2004) and create more opportunities for in-house employees (Oza and Hall, 2005).

This means that it is essential to determine clear goals and objectives to guide an on-going organisational effort for ERP implementation. This is especially so because the project may exceed the predetermined time frame for a typical business project. The 'triple constraint' of project management specifies three often competing and interrelated goals that need to be met: scope, time, and cost goals.

This theme was derived from remarks such as:

> *The timeline and scope must be realistic and well defined,*
>
> *Not just technological change, but mostly organisational, it is not just plugging a hole in software but a re-engineering of the entire organisation,*
>
> [It requires] *top management commitment and support all the way".*

The need for prior definition of goals was reflected in the comment:

> *The management established a steering committee which reported to the directors about the development of the project and also pointed up problems ... the importance* [of the project] *and the priorities were clear all over the organisation all the way.*

Somers and Nelson (2001) suggested that expectations should be carefully managed as ERP systems may fail to meet expectations despite making positive contributions to the organisation. The expectations of the organisation may exceed the capabilities of the system, if the systems are 'oversold' by the vendor.

Theme K: ***Working Teams***

Relative importance rating: 13

Mean rate of frequencies: 1.47

Compatible issue in semi-structured interviews: ***Organisation - Vendor relationship***

This theme was derived from comments by the respondents such as:

> *The team and the team leaders organised the involvement of many people in the project, the teams were defined according to the modules,*
>
> *The team consisted of external consultants and our home staff,*
>
> *The end-users were given the opportunity to influence the decisions,*
>
> *Our employees worked very closely with the expert consultants.*

These findings indicate that it is very important to establish balanced working teams and to outline the right working and collaboration procedures for their cooperative work. Sumner (1999) asserted that the IT team should develop collaborative work between external consultants and internal staff so that the internal staff can develop the necessary technical skills for design and implementation. Both technical and business knowledge are essential for success (Bingi et al., 1999; Sumner, 1999). Setting up efficient communication tools for information exchange between the outsourcing parties will improve their cooperation (Oza and Hall, 2005). Chakrabarty, Whitten and Green (2007) argued that the quality of the relationship and the level of collaboration between the outsourcing vendor and the organisation significantly influence the outcome of the outsourcing arrangement for both parties. Kreitner and Kinicki (2007) suggested that when organisations are culturally similar, they share similar value systems and work ethics and this makes it easier to communicate and cooperate successfully.

An ERP project involves all functional departments of the organisation and demands the effort and cooperation of technical and business experts as well as end-users. According to Kumar and Hillegersberg (2000), an ERP implementation team should comprise a balanced cross-functional mix of external consultants and internal staff and may include functional personnel and management, IT personnel and management, top management, IT consultants, ERP vendors, parent organisation employees, management consultants, and the hardware vendor. Internal staff learn the necessary technical skills from the external consultants. Stratman and Roth (2002) argued that having competent members in the project team is an important success factor for IT implementation. Members of the project team(s) should be empowered to make quick decisions.

Theme L: ***Organisational behaviour***

Relative importance rating: 22

Mean rate of frequencies: 0.67

Compatible issue in semi-structured interviews: ***Organisation-Vendor relationship***

This theme relates to organisations' need to consider that when they outsource their IT systems, changes can and do occur in the roles and job scopes of the internal IT

teams. In his work on change management, Kotter (1996) indicated that the involvement of employees in the change process is critical to successful change: to the extent that there is more participation of the internal IT team in the outsourcing arrangement, the outsourcing result will be better.

An additional aspect of organisational behaviour that Kakabadse and Kakabadse (2000) suggest should be considered is the cultural fit between the vendor and client organisation, which they consider essential for outsourcing success. On the other hand they specify that a cultural misfit may cause the loss of morale among internal staff, leading to resentment and possible counterproductive actions. Furthermore, conflict between internal teams and outside vendors could also lead to a less than optimal result of outsourcing. Poor communication and unclear measurements can also contribute to poor outsourcing results.

This theme was referred to in the following responses:

> *Organisations should have a strong corporate identity that is open to change*
>
> [Its necessary to achieve] *better communication,*
>
> *Users must be trained,*
>
> *Management should also have a strong commitment* and involvement,
>
> *... in order to produce the best possible cooperation among all the project participants.*

In this context, Sumner (2000) noted that ERP causes significant cultural transformation in the organisation and tends to lead to resetting of organisational values in terms of discipline, change and processes. Additionally, Elmes et al. (2005) indicated that ERP projects have a significant influence on managerial power and worker behaviour.

The literature often discusses "management problems" in conjunction with other issues such as the use of outsourcing to reduce union power (Burgess and Macdonald, 1990), to solve problems of recruitment and staff selection (Pfeffer, 1994) and to induce staff to adopt change (Reilly and Tamkin, 1996). Arnold (2006) recognised that organisational change is inevitable and that workers are affected by ERP implementation, because ERP implementation demands the replacement of existing business processes with standardised processes determined by application

vendors (Holland and Light, 1999). Baldwin, Irani and Love (2001) suggested that management support is required to address all the side effects of IT Outsourcing, such as employee dissatisfaction and fear of downsizing, and in general to reduce resistance concerning the new partnership. To deal effectively with these issues, ERP implementation can only be accomplished when senior management is totally committed to the initiative (Zairi and Sinclair, 1995). Management commitment and support is the ultimate strategy that will secure the necessary conditions for successfully introducing the change brought by ERP into the organisation. Change requires a strategic vision to ensure its long-term success (Aladwani, 1999).

As the groups of Managerial reasons and Organisational reasons were separated in the results of the quantitative stage, compared to their unification in the qualitative stage, triangulation was conducted at this stage separately for each group. The qualitative findings from the "Managerial" category in the open-ended part of the questionnaire were triangulated with quantitative findings from the close-ended questionnaire in Stage Two in relation to the motivations for the use of IT Outsourcing in ERP projects. The results appear in Table 10.2 below:

Table 10.2: Triangulation of qualitative findings for the 'Managerial' category with quantitative findings relating to motivations for use of IT Outsourcing

Relative importance rating (Scale 1-31)	Motivations for the use of IT Outsourcing in ERP projects derived from the " Managerial " category
2	To employ experienced professional manpower to manage the ERP project
9	To get a commitment to timetable and products and a pre-defined and closed budget
12	To accumulate knowledge and experience for in-house staff regarding the way that new system is developed and operates
14	to improve efficiency and performances with a flexible development process
16	To introduce external viewpoints and disciplines into the organisation
26	To enable optimal utilisation of in-house staff
31	To gain the ability to impose penalties for non-performance / non-compliance with goals

Qualitative findings from the "Organisational" category of the open-ended questionnaire were triangulated with quantitative findings from the close-ended questionnaire in Stage Two regarding the motivations for the use of IT Outsourcing in ERP projects. The results appear in Table 10.3 below:

Table 10.3: Triangulation of qualitative findings for the 'organisational' category and quantitative findings relating to motivations for use of IT Outsourcing

Relative importance rating (Scale 1-31)	Motivations for the use of IT Outsourcing in ERP projects derived from the 'Organisational' category
13	Overcoming the difficulty in recruiting and maintaining IT professionals
18	To cope with deficiencies of in-house staff
19	Facilitate and simplify performance of changes in the organisation
21	Add more personnel to fill a need for short-term, part-time or temporary efforts
27	To maintain more stable in-house staffing levels
29	To reduce number of direct employees

CATEGORY 3: ECONOMIC CONSIDERATIONS

Theme M: ***Economic benefits***

Relative importance rating: 3

Mean rate of frequencies: 2.13

Compatible issue in semi-structured interviews: ***Motivation for the use of IT Outsourcing***

This theme was rated in third position by the respondents. It includes not only the lowering of direct expenses and compliance with balanced development budgets, but also achieving overall economic benefits (when the project is completed successfully and in time, with minimum frictions between IT teams, management and internal uses and successful adoption by the organisation).

This finding was derived from remarks such as:

> *Efficient use of resources, I order* [outsourcing services] *according to specific need so that a minimum in-house work force is left*,
>
> [outsourcing to] *gain flexibility*.

One of the IT managers noted

> *It is important for me to consider the activities as operating expenses…my current team is now better employed and managed…our human resources department controls the organisation requirements and sometimes the influence of the budget is very restricting*.

One technical strategy that can reduce expenses is attempting to implement the ERP package with minimum "*customisation and deviations from standard*" and maximal use of the package with no extra development work, as one of the respondents explained: "*External consultants with high level knowledge and experience implement the system with minimum deviations from standard*". Wang et al. (2008) suggested that the combination of expertise, reliability and experience offered by outsourcing providers as well as their economies of scale facilitate the possibility of overall better performance for IT functions.

Theme N: ***Increased control of IT expenses***

Relative importance rating: 8

Mean rate of frequencies: 1.80

Compatible issue in semi-structured interviews: ***Motivation for the use of IT Outsourcing***

This theme was derived from responses such as:

> *Lack of control could cause confusion and reduced confidence in attaining the planned budget,*
>
> *It is very important to track the development of the project and the expected expenses in each step and to compare them with the actual performance and this also establishes some protection for a better response. Controlling expenses is done by comparing the planned amounts and costs with the actual amounts and this will give the management the ability to respond to the diversions and to correct and adjust costs along the way.*

These remarks of the respondents indicated that they understood the need to monitor and control the project development with concern for the economic aspects. Responsible monitoring of the outsourcing activities can help to reduce operational costs (Lacity and Hirschheim, 1993b). Conducting careful monitoring of payments and requirements, following-up on the progress of the project's implementation and discussing possible discrepancies as promptly as possible helps to manage developing problems and risks (Ozer and Hall, 2005). Organisations may not realise the expected cost savings because they fail to include hidden costs, such as transition, training, knowledge transfer, measuring, quality control and travel in the estimates (Barthelemy, 2001; Mistra, 2004). Fjermestad and Saitta (2005) indicated that secondary savings or more revenue can be achieved through improved operations. For example, replacing a vendor due to unsatisfactory relations or performance involves tenders and acceptance exams which also cost money and time and investment in assimilation to the project and learning processes. More efficient consumer-vendor processes save the need to replace the vendor and the consequent expenses.

Theme O: ***Economic considerations***

Relative importance rating: 9

Mean rate of frequencies: 1.80

Compatible issue in semi-structured interviews: ***Success factors***

This theme relates to issues that are important when attempting to reduce overall risks, time and resources in ERP project development. The theme was derived from remarks such as:

> *We knew that the implementation was just the starting point, stabilisation and future developments are needed, ERP systems require continuous investments in new modules and upgrades,*
>
> *Skilled personnel is costly,*
>
> *Experts can actually save us much time as they are familiar with the tasks and will perform it faster than our in-house team.*

The respondents were clearly aware of the intrinsic economic considerations and continuous investments involved in ERP projects and appreciated experts who were knew the work and thus contributed to cost saving.

Barthelemy (2001) indicated that costs can be better managed and reduced if safer activities are chosen for outsourcing and sufficient time is spent researching different vendors, because of lower transition and managing effort.

Theme P*: Economic Drawbacks of ERP Implementation*

Relative importance rating: 18

Mean rate of frequencies: 0.93

Compatible issue in semi-structured interviews: ***Success factors***

This theme differs from Theme B above (***Drawbacks of ERP Implementation***) which related to technological drawbacks since it relates to economic drawbacks. Technological drawbacks were considered as a most important factor in the implementation process.

The theme was derived from responses such as:

Any delay in schedule has significant results, mainly economic,

It is recommended to have reasonable timetables,

We had some changes which caused us over budget costs.

Despite the many benefits of the ERP systems, as noted it also has a number of drawbacks especially as the early systems tended to be large, complicated, and expensive. In these early days, implementation required enormous time commitment from an organisation's IT department or outside professionals and also new procedures, employee training, and both managerial and technical support sometimes slow and painful process. Once the implementation phase was completed, some businesses had trouble quantifying the benefits they gained from ERP (Yusuf et al., 2004).

Even today, with easier more sophisticated implementations, a plausible explanation for implementations being late and over budget is that initial stages of the implementation took longer than expected or that the organisation did not understand the offering by the vendor before the contract was signed (Adam and Sammon (2004).

This theme, P *Drawbacks* relates to possible obstacles that may occur during the implementation such as delay in the development or non-compliance with timetables with consequent economic damages, this differs substantially from Theme O *Economic considerations* which relates to the need for economic preparation before the project begins and possible economic implications of this planning.

Theme Q: ***Cost saving is questionable***

Relative importance rating: 25

Mean rate of frequencies: 0.47

Compatible issue in semi-structured interviews: ***Motivation for use of IT Outsourcing***

This theme was derived from remarks such as:

A vendor's experience and expertise may enable it to perform certain functions with greater efficiency and effectiveness,

Efficiency needs to be improved,

Expert's salary is among the highest in the industry.

According to Ondo and Smith (2006), some organisations are under the impression that IT vendors possess the necessary economies of scale to deliver cost savings compared to an organisation's internal IT department costs. However, an organisation's attempts to save IT costs by using IT Outsourcing functions are sometimes thwarted by the fact that the experts' fees are very expensive.

This theme differs from the other themes in this category because it relates specifically to actual costs which may not be cost-effective due to the fact that the cost of engaging external ERP experts is very high. However since these experts are considered critical for the organisation's success because they can prevent defects and discover whether something in the process was not conducted properly thus preventing unexpected costs – this cost saving is not measurable and perhaps questionable. On the other hand in the long run, the expert's effective performance may produce substantial cost-saving to the organisation in terms of increased effectiveness.

Kern et al. (2002) assert that the most common drivers for IT Outsourcing are financial (reducing costs, replacing capital outlays with periodic payments). Organisations are aware of the need to lower costs including support and maintenance costs (Ross and Vitale, 2000; Klaus et al., 2000). According to Mistra (2004) it is important to include estimation of hidden costs, such as training and quality control and to maintain realistic expectations regarding cost savings.

Qualitative findings from the 'Economic' category of the open-ended questionnaire were triangulated with quantitative findings from the close-ended questionnaire in Stage Two in relation to the motivations for the use of IT Outsourcing in ERP projects. The results appear in Table 10.4 below:

Table 10.4: Triangulation of qualitative findings for the 'economic' category and quantitative findings relating to motivations for use of IT Outsourcing

Relative importance rating (Scale 1-31)	\motivations for the use of IT Outsourcing in ERP projects derived from the 'Economic' category
4	To reduce time – an outsider expert can complete the job faster than the in-house team
20	To reduce ERP project development costs
23	To avoid increasing the in-house work force
25	Flexible budgeting of the project
28	To rationalise expenses: Transforming a capital investment (in-house staff wages) into operational expenses for external staff
30	To share or reduce risks by sharing with an external entity (fines for non-compliance with goals)

CATEGORY 4: STRATEGIC CONSIDERATIONS

Theme R: ***Maintaining the organisation's core-competence***

Relative importance rating: 4

Mean rate of frequencies: 2.00

Compatible issue in semi-structured interviews: ***Motivation for the use of IT Outsourcing***

The core competencies of any organisation are certain activities that give it its unique character and are essential elements of its identity. Outsourcing peripheral operations (such as IT) allows the organisation to pay more attention to its core competencies, as was succinctly explained by Bénaud and Sever (1998) who recommended that organisations should do what they do best and outsource all the rest.

This theme was ranked as number four in the list of themes by the respondents and was derived from comments such as:

> *We are a communication engineering company, and our staffs are developing in it* [the ERP project]. *We purchase IT services as support services and this is convenient,*
>
> *The core is not IT* [so] not *all the upgrades and technical issues apply,*
>
> *Getting deeply involved in the organisation's development, not IT development*.

According to these findings, it seems that the respondents understood that the organisation should acquire support to perform IT functions (by outsourcing) as the organisation prefers to focus on its core activities. In line with these comments, Quinn and Hilmer (1994) also asserted that IT Outsourcing allows organisations to focus on core competencies, while having access to the leading external competencies and expertise in the IT industry (Kakabadse and Kakabadse, 2002). Gonzalez, Gasco, and Llopis (2006) argued that by virtue of their domain knowledge and focus, vendors can and do attract relevant human resources and are often better able to retain them. The vendors can then provide clients with the flexibility to scale up resources quickly. Many organisations find it an attractive option since they can also scale down any unnecessary resources when required.

Theme S: ***IT Outsourcing is the de-facto procedure when implementing ERP***

Relative importance rating: 5

Mean rate of frequencies: 1.93

Compatible issue in semi-structured interviews: ***The critical impact of ERP success or failure on the organisation's performance***

This theme was derived from comments by the respondents such as:

It is compulsory to start such a project with consultants, using IT Outsourcing,

The main reason [for outsourcing] *is their knowledge and experience,*

The use of an external team was essential and unavoidable.

One respondent also emphasised how important it was to "*gain robust and stabilised software infrastructure and applications*".

These comments demonstrate that the respondents believe that the use of IT Outsourcing in ERP projects is essential and unavoidable because of the critical need for knowledge and experience.

ERP systems have an extensive organisational impact due to their broad scope, and they are probably among the most complex administrative systems that have been developed for business administration (Sumner, 1999). Additionally these are mission-critical systems that must be rapid deployed. For these reasons their implementation requires the best experts with wide past hands-on experience in other organisations. Therefore, access to best-practice capabilities for the development process of strategic systems is best done with the assistance of outside expert consultants, (Sumner 1999; Somers and Nelson, 2001).

Theme T: ***Failure is a deadly risk for the organisation***

Relative importance rating: 14

Mean rate of frequencies: 1.33

Compatible issue in semi-structured interviews: ***Success factors***

This theme was identified in responses such as:

This ERP system is our largest-ever IT investment,

We invest all our efforts to attain a stable system,

All our business processes and activities run on this complex system. Failure is a deadly risk for our organisation,

[It contains] *critical data for business performance analyses, going beyond just running the operation,*

A day of shutdown is very expensive and damaging,

Success of the system facilitates our business's strategic competence.

ERP systems affect so many aspects of an organisation's internal and external operations, that their successful deployment and use are critical to organisational performance and survival. Successful implementation is vital, since the costs and risks of these technology investments rival their potential pay-offs. Fowler and Gilfillen (2003) even warn that failures of ERP system implementation projects may lead to the organisation's bankruptcy

Theme U: ***Maintaining strategic assets***

Relative importance rating: 21

Mean rate of frequencies: 0.73

Compatible issue in semi-structured interviews: ***Motivation for use of IT Outsourcing***

This theme expresses the need to be concerned about the organisation's assets as outsourcing exposes the organisation to new strategies, disciplines or services. It includes the consideration of issues such as: maintenance and updating of organisational knowledge assets, keeping the organisation's competitive market status, improving customer service (inside and outside the organisation), and the organisation's innovative capacity.

The theme was derived from remarks such as:

After all this huge investment, we have to maintain and improve our status in many aspects such as user service quality, innovative and new strategies, and we need to maintain our organisational assets.

Relying on Resource-based Theory, Grant (1996) and Teece, Rumelt, Dosi and Winter (1994) explained that organisations evaluate their own IT resources and capabilities in comparison to the market, giving consideration to their strategic potential. The discovery of deficits within the organisation leads to consideration of market utilisation, relating to attainment of complementary resources and capabilities.

Theme V: ***Strategic risks when using outsourcing***

Relative importance rating: 23

Mean rate of frequencies: 0.60

Compatible issue in semi-structured interviews: ***Problems involved in using outsourcing in an ERP project***

This theme was ranked among the ten lowest rated themes, indicating that the respondents were aware of the risks involved in the implementation process of an ERP project and of the need to conduct certain defensive activities.

The theme was derived from comments such as:

> *Our goal was to have a running system with the best level of performance something that we could only achieve with external knowledge. We understood that being dependent on the provider has some risks, and in order to protect the organisation, we contracted with different providers for some critical modules.*

Slevin and Pinto (1996) maintained that every IT implementation project carries important elements of risk, such as deviation from the plan at some point in the project life cycle. ERP implementation project risks described in the literature include uncertainties, liabilities or vulnerabilities that may cause the project to deviate from the defined plan. Risk management is the competence to handle such unexpected crises and deviations from the plan. Alexander and Young (1996) highlighted the risk of becoming dependent on a supplier. Lacity et al. (1996) argued that organisations hope to leverage the vendor's resources and share any risks of non-performance of the IT function with the vendor, as was found in the above quotation, some even engage in multi-vendor outsourcing arrangements to further mitigate any remaining risks.

Another risk mentioned by a respondent in the present research was that: *"the consultants do not stay long with the organisation and we are worried about keeping the new knowledge available in house.*" This risk was also noted in the literature by some researchers such as Quinn and Hilmer (1994) and Doig et al. (2001) who identified the possibility of a loss of vital know-how, in particular with respect to core competencies as a major risk factor in outsourcing.

Qualitative findings from the 'Strategic' category of the open-ended questionnaire were triangulated with quantitative findings from the close-ended questionnaire in Stage Two in relation to the motivations for the use of IT Outsourcing in ERP projects. The results appear in Table 10.5 below:

Table 10.5: Triangulation of qualitative findings for the 'economic' category and quantitative findings relating to motivations for use of IT Outsourcing

Relative importance rating (Scale 1-31)	Motivations for the use of IT Outsourcing in ERP projects derived from the 'Strategic' category
5	Swifter response to achieve organisational and strategic objectives
7	To access best-practice capabilities in order to develop strategic systems
10	So that the organisation can be exposed to new strategies, disciplines or services
15	To enable the organisation to focus on / OR allocate resources to core business issues
17	To improve customer service (both intra- and extra-organisation)
22	To be more market competitive

CATEGORY 5: RELATIONS WITH OUTSOURCING VENDORS

The themes in this category (*Relations with outsourcing vendors*) are not considered to be directly involved in the motivation to use IT Outsourcing in ERP projects, but they were taken into account for the construction of the second part of the close-ended questionnaire in which respondents were asked to rate a list of success factors.

Theme W: *Contract and Legal issues*

Relative importance rating: 11

Mean rate of frequencies: 1.67

Compatible issue in semi-structured interviews: ***Organisation-Vendor relationship***

This theme was derived from comments such as:

Scope of the outsourcing contract,
A fair agreement and reasonable requirements,
Short term contracts,
It is also important to define the possible penalties in the contracts.

The importance of the contract was well understood by the respondents. The contract represents the legal and formal aspect of the organisation-vendor relationship. Currie and Willcocks (1998) cautioned that the management and coordination of multiple contracts are very time-consuming, suggesting that risks could be reduced by fully understanding the nature of the work outsourced, signing short-term contracts and demanding up-to-date documentation about those contracts. Currie (1998) complements this knowledge by noting that the customer has the ability to retain the skills and competencies needed to ensure that contracts add value to profits, for example, by ensuring that vendor employees can later be acquired by the organisation (see below on reversibility contracts at the end of this page).

Weston(1997), asserted that letting one vendor provide all enterprise systems is an attractive but risky proposition .On the other hand, the risk of having multiple suppliers, who may not work together effectively should be balanced by good management and clearly defined responsibility in the contract.

Young (2008) also discussed the importance of clear contract specifications adding the need for formal measures of outsourcing performance while Lin, Pervand and McDermid (2007) also included the need to relate to staff transition management in

their list of recommended actions, to design flexibility within contracts and to conduct periodical reviews to see if changes are needed. As the business environment is changing all the time, flexibility in contracts gives the organisation the possibility to tune the agreement to match current needs and realities (Sullivan and Ngwenyama, 2005).

Organisations are cautioned against incomplete contracts and service level agreements which might lead to a situation where the goals are interpreted in the wrong way (Kern and Willcocks, 2002; Oakes, 2005). Baldwin et al. (2001) indicated that the length of the contract term should be short rather than long, at least initially, as short term contracts have achieved higher success rates than long term contracts.

Barthelemy (2001) recommended two types of clauses to include in the IT Outsourcing contract to prevent trouble: (1) evolution clauses relating to technology, price and scope of the outsourcing contract (e.g. benchmarking clauses) and (2) reversibility clauses relating to either material or human reversibility which would give the organisation the permission to hire employees from the outsourcing vendor.

In general, it is suggested that organisations should analyse and re-negotiate the contracts if they feel that the arrangement is taking them into the wrong direction or they feel that they are not achieving the items they were aiming for (Baldwin et. al., 2001).

Theme X: ***Maintaining experts' knowledge***

Relative importance rating: 15

Mean rate of frequencies: 1.27

Compatible issue in semi-structured interviews: ***Organisation-Vendor relationship***

This theme was derived from remarks such as:

> *We also try to transfer the new knowledge by training our internal people while working together in an integrated internal and external workforce team,*
>
> *Building a knowledge base on IT and business related topics helps us to utilise our IT and business potential,*
>
> *About thirty people participated in the project, including the external force.*

For each expert, we added one or two internal IT staff as escorts who joined the external implementer, who we called 'shadows'.

It is important to educate and train the internal work force if the organisation prefers to be less dependent on external valuable resources, especially for the long term. Gable et al. (2003) suggested that the experience accumulated during the outsourcing should be effectively shared inside the organisation so that other departments can also gain from that knowledge, thus enabling in-house talent to cope with regular operation of the system and reducing the need for external consultants (Barthelemy, 2001). Koh et al. (2004) indicated that efficient knowledge transfer, sharing industry's best practices and delivering comprehensive and high quality documentation all play an important role in ensuring the outsourcing project's success.

Theme Y: ***Operational Factors***

Relative importance rating: 16

Mean rate of frequencies: 1.20

Compatible issue in semi-structured interviews: ***Organisation-Vendor relationship***

This theme includes all the operational issues that are coordinated with the vendors: mutual planning and benchmarking, construction of mechanisms for supervision and control of progress, vendor's technical assistance, vendor works according to systematic project management methodology, effective management of 'surprises' and unanticipated incidents, and correct calculation of hidden costs in advance.

This theme was derived from respondents' answers such as:

It is important to establish a good communication mechanism with the vendors, to be prepared for any change or restriction,

A good relationship will create trust, much more confidence and motivation and this is more beneficial for the organisation,

The management of the project was reasonable proper management, with [pre-set] *milestones, with insurance percentages, supplementations etc., everything that needed supervision.*

A strong and active management team is necessary to deal with the operational issues. Adequate staffing ensures that resources are managed optimally and that issues and risks are managed promptly when they appear (McFarlan and Nolan, 1995).

Theme Z: ***Trust and cooperation***

Relative importance rating: 17

Mean rate of frequencies: 1.07

Compatible issue in semi-structured interviews: ***Organisation-Vendor relationship***

This theme was derived from the following responses of the respondents:

> *When we need a solution from the consultant, it is very important for us to know that the ideas are directly relevant and free of any other interest,*
>
> *There must be a high level of trust with the consultant,*
>
> *We have established good communication and guidelines relating to mutual decisions.*
>
> *Transferring knowledge without restrictions.*

The existence of this theme indicates that the respondents understood the significance of trust and cooperation between the IT outsourcers and the internal organisation staff. Barthelemy (2001) suggested that building trust is a way to advance the relationship in a strategic direction and also to reduce the cost of managing the outsourcing relationship. Trust can be promoted by ensuring that both organisations' objectives are understood, by fostering good communication through discussion of potential problems as soon as they appear and striving to conduct face-to-face meetings (Barthelemy, 2001; Jennex and Adelakun, 2003). When the mutual trust level is high, both parties will work harder to deal fairly with potential problems. This can potentially mean that the organisation saves costs stemming from managing problems between the outsourcing parties and the delays that they cause. Lee and Kim (2005) considered knowledge sharing (explicit and tacit) as one of the important predictors in IT Outsourcing success.

Gefen, Wyss and Lichtenstein (2008) suggested that effective relations between outsourcing parties necessitate clear and detailed policies and guidelines on the cooperation mechanism between vendors and internal staff, coupled with a clear description of the objectives of the arrangement and the measures used to determine success. Interdepartmental cooperation and communication was mentioned as significant for successful relations between the parties by some researchers (Somers and Nelson, 2001; Akkermans and van Helden, 2002). Al-Mashari and Zairi, (2000) claimed that one reason for ERP failure is lack of communication.

Additionally, knowledge about what the system can deliver to the organisation will help its workers to build realistic expectations for the system, thus helping to overcome resistance, which might otherwise engender failure from the outset. In some cases, the outsourcing relationship goes further than just substituting for an internal IT service and a contractual relationship is sought where the service provider assumes responsibility for one or more of the organisation's IT or even business functions (Willcocks and Lacity, 1999).

Theme AA: ***Vendor's Selection***

Relative importance rating: 19

Mean rate of frequencies: 0.87

Compatible issue in semi-structured interviews: ***Organisation-Vendor relationship***

This theme was derived from comments such as:

> *To evaluate the vendor's motives and capabilities, and opportunities,*
>
> *High level consultants.*
>
> *We searched for experienced consultants with strong managerial and professional experience and abilities.*

These responses indicate that the mission of searching for and selecting the appropriate vendor has a major effect on the success of the project. Considerable efforts are required to reach the right decision with adequate consideration of all the different aspects such as the vendor's experience, availability, motivations, abilities and capabilities.

According to Lacity, Willcocks and Feeny (1996), the strength of the vendor should be evaluated from several perspectives and its technical ability is an important part of outsourcing success. Partners with expert skills and significant experience can positively influence the success of an outsourced function. Vendors are expected not only to be able to perform a specific task, but also to draw on their domain expertise in order to achieve the desired result within reasonable time and resource limits. The familiarity and experience of the vendor with the customer's industry and business processes also plays a strong role in the success of the outsourcing arrangement (Gefen et al., 2008). When vendors are familiar with the customer's business industry, they are better able to leverage their knowledge of industry best practices to perform the outsourced function. In addition, the vendor will be more sensitive to any idiosyncratic requirements of the industry and propose viable solutions to issues that arise (Weeks and Feeny, 2008).

Lee and Kim (2003) draw attention to the quality of offered services because organisations pursue outsourcing for higher quality services. A proper analysis of service quality during the construction of a relationship with the service provider is imperative for a successful outsourcing project. The smaller the discrepancy between service receiver and service provider, the greater the quality achieved. The vendor selection process should also take into account the vendors' ability to integrate new technologies and solutions into their client organisations, and should enable the organisations' customers to derive new capabilities (Lacity et al, 1994; Seddon et al., 2007). As already noted, it is advantageous to use more than one vendor and not to rely only on one with no other alternatives and this strategy helps avoid future risks (Baldwin et. al., 2001; Oza and Hall, 2005).

Table 10.6 below lists the success factors and their relative importance ratings according to the four identified success factor groups. The data were derived from the quantitative findings from the close-ended questionnaire in Stage Two. These results are discussed in detail in the next chapter.

Table 10.6 Results of ratings for success factors in the closed-ended questionnaire

Success Factors	Relative importance rating (Scale 1-33)
Top Management Factors	
Commitment, involvement and endorsement by the organisation's management	**1**
Definition of goals and methodical planning of the project	**12**
Strategic and Organisational Factors	
Learning from the vendor's sophisticated management and technological tools	**4**
Overcoming resistance within the organisation before the project begins	**5**
Constructing a combined balanced team from the external and internal manpower	**15**
Reducing the extent of dependence on the external vendor	**18**
Treatment of information security within the organisation	**19**
Taking care to maintain the knowledge within the organisation	**24**
Professional treatment of the technical infrastructure and materials	**28**
Factors relating to Vendor Selection and Contract	
Choice of vendor with strong managerial and professional experience, Introduction of change	**2**
Pre-determination of logical timetable for project performance	**6**
Ensuring a high level of consultants in key positions (management, architecture, and implementation).	**7**
Agreement with the vendor concerning contents at the specification stage	**11**
Examination of the vendor's ability to comply with professional and managerial commitments	**14**
Vendor's undertaking for stable staff during project	**20**
Preference for a vendor with prior knowledge of the customer's systems	**21**
Lucid contract clearly defining vendor-client obligations	**25**

Success Factors	Relative importance rating (Scale 1-33)
Definition of detailed work plan for the vendor	**30**
Alterations of contents and work conditions coordinated with vendor	**33**
Factors relating to Working with Vendor	
Tight cooperation between vendor and client	**3**
Construction of set-up with decision-making mechanisms	**8**
Providing the vendor's employees with an empowered sense of identification	**9**
Agreement with the vendor concerning contents at the specification stage	**10**
Flexibility in handling of consultants and the external companies for better control and supervision	**13**
Creation of common vendor-client approach (WIN-WIN)	**16**
Vendor's stipulation to ensure fair and proper work conditions for his employees	**17**
Assimilation of the vendor within the organisation's culture	**22**
Effective management of "surprises" and unanticipated incidents	**23**
Vendor works according to systematic project management methodology	**26**
Construction of mechanism for supervision and control of progress	**27**
Correct calculation of hidden costs in advance	**29**
Vendor undertakes to conduct training of replacements, guidance and instruction	**31**
Adding external independent consultants to ERP project manager	**32**

10.3 Summary

This chapter discussed the qualitative findings emerging from Stage One of the research, and their triangulation with the quantitative findings from Stage Two of the research in order to test the relevance and relative importance of the emergent success factors. The next chapter continues the discussion relating in more detail to the quantitative data.

Chapter 11 – Success Factors of IT Outsourcing in ERP projects

This chapter discusses the success factors for the employment of IT Outsourcing in ERP projects in Israel that emerged from the qualitative and quantitative research findings, organising and explaining the evidence to answer the main research question. The closed-ended questionnaire served here as an appropriate tool to define and test the success factors in detail. The findings of the closed-ended questionnaire indicated that all respondents thought that it is impossible to implement an ERP project without the support of IT Outsourcing.

A list of thirty three close-ended questions represented different aspects of the success factors for IT Outsourcing in ERP projects in Israel. These formed the basis for four groups of success factors. Analysis of the quantitative results from the closed-end questionnaire administered in Stage Two, indicated the following order of importance for these four groups of success factors: (1) Top management Commitment, (2) Strategic and Organisational views, (3) Vendor selection and contract, (4) Working and managerial process with vendor.

Analysis of the results of part 2 of the closed-ended questionnaire affirmed these four groups of success factors and established the relative importance weight for the groups of factors and for the individual factors inside each group. Dividing the total number of mentions of a factor or group of factors by the number of respondents produced the mean rate of frequency of the factor, indicating its relative importance weight. For example the mean for the success factor 'Commitment, involvement and endorsement by the organisation's top management ' which scored 4.72 points was calculated by dividing 340 by 72 respondents. The results of this weighting procedure allowed the ranking of the different factors according to relative importance. Each group of factors is now discussed, relating to the relative ranking and weight of each of their constituent factors.

11.1 Factor Group 1: Top management commitment

This leading group included two factors:

Success Factor *IA*: Commitment, involvement and endorsement by the organisation's top management

Relative Importance Ranking: 1

Relative Importance Weight: 4.72

This factor was ranked with the heaviest importance weight i.e. the respondents thought that it was the most significant factor for the success of ERP systems' implementation and maintenance in organisations with the assistance of IT Outsourcing.

The significance of this factor is supported in almost all relevant theoretical and research literature. The role of top management in the implementation of ERP systems has been noted as a main factor in the Critical Success Factors (CSF) list by studies such as Somers and Nelson (2001), Zhang et al. (2002), and Nah, Zuckweiler and Lau (2003). According to Wee (2000), top management should publicly and explicitly identify the project as a top priority. The implementation of an ERP project requires the acceptance, compliance, and commitment of a broad range of people because implementing any integrated ERP solution is not so much a technological exercise but an 'organisational revolution' (Ross et al., 2000). The project should receive approval from top management, who should not only act as observers but should be committed to involvement and willingness to allocate valuable resources to the implementation effort (Holland et al., 1999; Nah et al. (2003). Top management has the authority to make decisions regarding policy questions and is responsible to support and oversee the required needs all along the life cycle of the ERP project implementation and maintenance (Rosario, 2000).

Davenport (1998), asserts that as ERP projects span divisional boundaries and affect many stakeholders in an organisation, senior executives need to mediate between various interest groups to resolve political conflicts when necessary. According to Sumner (1999), a project leader should 'champion' the project throughout the organisation, meaning that the leader should act as a high level executive sponsor who has the power to set goals and legitimise change, to resolve conflicts and manage resistance and also to consider the business perspective. The 'presence of a

champion' i.e. a determined leader was also indicated as an important factor by other researchers (Kuang et al. 2001; Gable et al. 2003). Thus the research finding reconfirms the assertions in relevant literature and indicates the importance of the factor, management involvement, when the ERP implementation is accomplished with the assistance of IT Outsourcing.

Success Factor *1B*: Definition of goals and methodical planning of the project

Relative Importance Ranking: 12

Relative Importance Weight: 4.21

This factor was ranked as 12th in order of importance. The respondents indicated that clear goals, focus and scope were important when working to accomplish a successful IT project especially a complicated project such as the implementation of an ERP system.

Clear, measurable goals have a twofold effect, as they:

1. Help the project team to focus on important issues and thus ensure the timely performance of the project's tasks.
2. Define clear criteria for the project's success and failure and provide an opportunity for objective evaluation of the project team's work.

Similar results can be found in the literature, Nah and Lau (2005) suggested that the project's mission should be related to business needs and be explicitly declared to all project participants. Clear goals and methodical planning mean effective project management including the planning, coordination and monitoring of various activities at different stages of the implementation project, this is linked to and depends on Factor 1A: the involvement and the commitment of the management.

11.2 Factor Group 2: Strategic and Organisational aspects

This group was rated as second in importance. It includes seven factors:

Success Factor *2A*: Learning from the vendor's sophisticated management and technological tools

Relative Importance Ranking: 4

Relative Importance Weight : 4.54

Vendors usually have access to better resources, development tools, facilities and expertise than the organisation's in-house capabilities (Ondo and Smith, 2006). It is also often advantageous to adopt the discipline and the working procedures of the elected vendors that they have developed due to their experience in the IT field. Somers and Nelson (2001) also suggested that the organisation can learn to use the vendors' supporting and development tools, while Kuang et al. (2001) supported the use of the vendor's tools for monitoring and evaluating performance, software development testing and troubleshooting, to improve system control.

Other research findings mentioned this factor, for example Mitchell and Fitzgerald (1997), and Knolmayer (2002) and Westrup and Knight (2000) and Hossain and Shakir (2001a) who all related to the significance of the role of IT service providers and the ERP community.

Success Factor *2B*: Overcoming resistance within the organisation before the project begins

Relative Importance Ranking: 5

Relative Importance Weight: 4.45

For the purposes of this research, two types of employee resistance within the organisations were considered: (1) resistance to IT Outsourcing, and (2) resistance to ERP implementation. Respondents indicated that both types of resistance should be considered, since successful implementation of an ERP project with the assistance of IT Outsourcing requires the cooperation of all the participants in the project (in-house and external). Similar findings in the literature relate to various types of employee resistance, for example, IT employees may oppose IT Outsourcing when they see it as a threat to their working position or find themselves before a dismissal,

a retraining period, or a transfer to the service- providing organisation (Grover, Cheon and Teng, 1994). Gonzalez et al. (2004) argued that employees' productivity may deteriorate because of feelings of anxiety and insecurity caused by this uncertain situation during contract creation.

Implementation of ERP systems is an alteration determined by market changes and technological progress and engenders further changes inside the organisation, which may result in opposition, confusion and errors. Two principal sources of resistance to implementation of ERP systems are identified: the 'perceived risk' and 'habits'. The perceived risk is associated with the employees' fear that they might lose their work or status (such as a high-ranking position, etc.) and employees' desire not to change their habits (such as not having to perform a greater work load). The desire to avoid alteration in habits was considered a particularly important source of resistance by Zhang et al. (2002) and Mandal and Gunasekaran (2003). Some researchers identified cultural barriers between customer and provider as a friction point that might cause resistance (Aubert, Patry and Rivard, 2006; Iacovou and Nakatsu 2008). Respondents indicated that when resistance is overcome, cooperation increases and motivation is enhanced.

Success Factor *2C*: Constructing a combined balanced team from the external and internal manpower

Relative Importance Ranking: 15

Relative Importance Weight: 4.08

Respondents indicated the need for a balanced combination in the implementation team, so that both technical and business competence would be available in the team for the ERP projects, exploiting the skills and knowledge of in-house and external personnel. This finding is in line with the claim of Wee (2000) and Kuang et al. (2001) that IT Outsourcing was effective in constructing a balanced project team. Sarker and Lee (2003), suggest that the organisation's implementation team for the ERP project should include individuals representing different views and perceptions of the enterprise. The research finding reflects the idea is that the internal staffs are familiar with the organisations' business processes and the current systems and technologies, and the external staffs bring high technology knowledge.

Success Factor *2D*: Reducing the extent of dependence on the external vendor
Relative Importance Ranking: 18

Relative Importance Weight: 4.03

Organisations find it difficult to quantify the level of their dependence on an external provider as their needs are not static and tend to evolve over time. Respondents indicated that they supported the view of Whyte and Fortune (2002) that the organisation should be able to manage the influence of external consultants in the implementation project and also be able to optimally transfer the knowledge from the consultants into the organisation. Dependence on outside providers is costly to the organisation.

Lacity and Hirschheim (1993a) pointed out that external providers are not strategic partners, as the interest in profits is not shared. When the customer's costs increase, this is because the same happens to the provider's profits. There is a risk involved in long-term contracts or when product or service specifications limit the choice to a small number of suppliers (Earl 1996). One way to avoid being locked-in to a rigid contract, without the risk of vague terms, is to anticipate changes during the term of the agreement, and allow parties to re-negotiate a sub-set of terms and conditions at regular intervals (Gottschalk and Solli-Sæther, 2005). Bahli and Rivard (2003), and Oh, Gallivan and Kim (2006) claimed that overspending may occur due to high transaction costs and a small number of providers on market. However, outsourcing can be used to move to a more open, more standard, technology platform, such as ERP systems, adopting industry best practices and current technology to avoid specificity to a particular supplier (Gottschalk and Solli-Sæther, 2005).

Success Factor *2E*: Treatment of information security within the organisation
Relative Importance Ranking: 19

Relative Importance Weight: 4.01

Respondents gave relatively medium rankings for the importance of this factor (relative importance rank 19th). The factor relates to possible risks to the security of the organisation's knowledge and information stemming from the external relationships of vendors and consultants outside the organisation. ERP providers

usually serve several organisations, thus, security issues, are most important especially when a provider serves several direct competitors. Similar results in the literature relate to the vulnerability of client information and the need to protect it, for example, according to Grover, Cheon and Teng (1994) the provider must maintain confidentiality concerning information from all client organisations. Additionally the organisation should check its own security procedures, controlling access to information and systems (McCredie and Updegrove, 1999).

Iacovou and Nakatsu (2008) noted a significant risk to confidential technical data, the organisation's intellectual property. Therefore the security of the outsourced IT services must be negotiated within the outsourcing contract to ensure that IT security-related objectives (effectiveness, efficiency, adequacy, integrity, validity, authorisation, privacy) continue to be fulfilled (Fink, 1994).

Success Factor *2F*: Taking care to maintain the knowledge within the organisation

Relative Importance Ranking: 24

Relative Importance Weight: 3.63

Respondents indicated that the organisation is concerned that their products from their investments in the ERP system may need improving and maintaining and that their ability to do this will depend on their ability to learn and retain the knowledge involved in and accumulated in the project.

According to Willcocks, Lacity and Kern, (1999), organisations need to retain some specific technical and managerial knowledge in house. This can be done by appropriate and timely education and training of employees, and an effective mechanism to transfer knowledge from the provider. Education and training enables executives and employees to become familiarised with the logic and concept of ERP systems. Education also helps all employees to develop a better understanding of the relations between their own work and other functional areas of the organisation, and how the work that relates to certain business processes is going to be affected by the new system (Zhang et al., 2002; Hawking et al., 2004).

Success Factor *2G*: Professional treatment of the technical infrastructure and materials

Relative Importance Ranking: 28

Relative Importance Weight: 3.52

Respondents graded this factor at a low level of importance. However, they indicated that because the organisations want to gain the benefits of latest technologies, they therefore rely on the vendors' rich knowledge and the access of the vendors to such technologies.

This research finding is supported by Lacity and Hirschheim, (1993b) who explained that IT Outsourcing vendors are advantageous to the organisation since they can quickly adapt to machine upgrades and new software releases of the technical infrastructure and materials. They are also high motivated to make their offered service as profitable as possible. In theory, access to leading-edge technology is a persuasive argument in support of IT Outsourcing, as an organisation benefits from the latest technology without the lead-in time that is customary for in-house development (Palvia, 1995). Nevertheless in some cases vendors might try to avoid incurring additional expenses for such system upgrades, unless this is explicitly stipulated in the contract. In other words, if the IT Outsourcing contract does not include a clause that includes updating to future technological evolution, updating will not be performed (Glass, 1996). This may cause a lack of flexibility and inability to adapt to new technologies (Tafti 2005, Ngwenyama and Sullivan 2006).

11.3 Factor Group 3: Selection of vendor and the vendor-organisation contract

This group was rated as third in importance. It includes ten factors:

Success Factor *3A*: Choice of vendor with strong managerial and professional experience in the introduction of change

Relative Importance Ranking: 2

Relative Importance Weight: 4.6

Respondents ranked this factor as second in importance (out of all the constituent factors in this group). They indicated that the selection of vendors was a very important factor for the success of the IT Outsourcing ERP project and should be effectively considered, investigating information concerning the providers' managerial and professional abilities, their experience, and their involvement in other projects.

Significant attention is given to the preparatory investigation that organisations should make before hiring a vendor Bernroider and Koch (2000) suggested that organisations can gather information concerning the abilities of potential vendors through their presentations, analysis of marketing material, use of consultants, design of questionnaire, relevant training, analysis of a prototype system, and analysis of relevant studies. It is imperative that the information about the ERP vendors and system be accurate and reliable in order to be able to choose the strongest managerial and professional experience in the market.

Success Factor *3B*: Pre-determination of a realistic and logical timetable for project performance

Relative Importance Ranking: 6

Relative Importance Weight: 4.41

Respondents indicated that expectations from the project performance should be based on the management's pre-determined budget and timetable. However, if these estimations and plans are not realistic, the progress and the performance will not be measured fairly. Conversely, my rich experience indicates that if the timetable and targets are realistic this improves staff abilities and motivation to achieve

expectations according to the pre-determined plan.

This factor is mentioned by several sources. Holland et al. (1999) stressed the importance of identifying goals and benefits and tracking their performance. According to Laughlin (1999), an aggressive schedule and timelines should be included in the implementation programme in order to maintain a focus on business benefits. Buckhout, Frey and Nemec (1999) suggested that a clear business plan and vision should steer the direction of the project throughout the ERP life cycle. While Wee (2000) claimed that a business plan that outlines proposed strategic and tangible benefits, resources, costs, risks and timeline is critical.

Success Factor *3C*: Ensuring high-quality consultants in strategically important positions. Ensuring high quality consultants (managers, system architecture, implementation)

Relative Importance Ranking: 7

Relative Importance Weight: 4.39

Many organisations use IT Outsourcing consultants to facilitate the implementation process and project maintenance. Respondents indicated that organisations should try to acquire the best available professionals to lead and to perform the project. Consultants may have specific experience in specific industries, comprehensive knowledge about certain modules, and may be better able to determine which suite will work best for a given organisation (Somers and Nelson, 2001).

Research findings support the need to hire consultants with high quality skills. This research indicates that ERP project success depends on staffing the project with the best experts from the outsourcing providers and the best professionals from the organisation's IT divisions. The software is too complex and the business changes too dramatic to trust the project to just anyone, therefore the election of the vendors' candidates for consultancy should be a very strict process, although attention should also be given to their replacement when the project is over, either by acquiring the outside professionals as in-house staff or by training in-house staff (Koch and Wailgum, 2008).

Success Factor *3D*: Agreement with the vendor concerning contents at the specification stage.

Relative Importance Ranking: 11

Relative Importance Weight: 4.23

Respondents indicated that it is important to specify details of contents for the ERP package that is provided by the IT outsourcers. The specification stage of the project is a detailed plan of the content and adjustments that should be implemented for the organisation's specific needs. Respondents also indicated that the agreement specifications should be clear and agreed by both sides. This concept was stressed by Young (2008), who discussed the importance of clear contract specifications and determination of formal measures of IT Outsourcing performance. Sullivan and Ngwenyama (2005) suggested that the organisation should have the ability to tune the agreement to match current needs and realities.

Success Factor *3E*: Evaluation of the vendor's ability to comply with professional and management commitments

Relative Importance Ranking: 14

Relative Importance Weight: 4.17

Respondents indicated that it is important to identify potential risks due to the fact that the vendor has not properly planned and managed his workload of IT Outsourcing projects. Additionally they indicated that the organisation's management should attempt to attain all the relevant information and ask for references in order to ensure the vendors' abilities to deliver. Ngwenyama and Sullivan (2006) noted that it is also important to check the vendor's financial stability, as the organisation expects constant services to be regularly supplied. According to Alborz et al. (2003), using a due diligence process improves the outcomes of a set of pre-planning activities that both client and supplier undertake before signing a contractual agreement.

Success Factor *3F*: Vendor's undertaking for stable staff during project

Relative Importance Ranking: 20

Relative Importance Weight: 3.85

Although they rated this factor at a relatively medium rate of importance, respondents felt that it was important to obtain the vendor's commitment to the maintenance of a stable team at work throughout the project. This is necessary as it usually takes time for a team member to gain experience regarding all the specific managerial and professional aspects of the organisation's work. Constant attendance of the same staff also means that the external team members become familiar with the organisation policies and they can develop work relations that improve efficiency and performance.

Lacity and Hirschheim (1993b) and later on others such as Gonzalez, Gasco and Llopis (2004) and Ngwenyama and Sullivan (2006) found similar results. They warn that organisations that employ IT Outsourcing often encounter losses in business knowledge and experience, because vendors send their most qualified experts to get new customers from other organisations in the sector, yet once they have acquired the contract, less successful personnel are sent to replace the original experts.

Success Factor *3G*: Preference for a vendor with prior knowledge of the customer's systems

Relative Importance Ranking: 21

Relative Importance Weight: 3.69

Respondents indicated a medium importance ranking for this factor, noting that priority should be given to a vendor that is familiar with the organisation's systems, assuming that this knowledge is an advantage for both sides: the organisation and the vendor. Kakabadse and Kakabadse (2000) mentioned the importance of the vendor's familiarity with the customer's business (background, organisation structure, working process). A vendor who is already familiar with the implemented systems is more likely to be able to shorten learning processes thus reducing costs involved in a longer process and better performance efficiency.

Success Factor *3H*: Lucid contract clearly defining vendor-client obligations

Relative Importance Ranking: 25

Relative Importance Weight: 3.59

This factor was rated with a relatively low importance ranking although this may have been influenced by the fact that certain elements of this factor were already included in Factors 3B and 3D. Respondents indicated that the organisation and the vendor need to clearly define their legal obligations with the best considerations for different situations. The contract should take all these potential situations into account in order to eliminate conflicts and unexpected disagreements.

In addition to the legal aspects of the relationship, Klepper and Jones (1998) asserted that in order to benefit from IT Outsourcing, positive client–vendor relationships should be maintained, pointing out that client-vendor relationships in IT Outsourcing arrangements are determined not only by actions and attitudes of managers and staff in both client and vendor organisations (Klepper and Jones, 1998), but also by the configuration of the IT Outsourcing arrangement. This arrangement is the way an organisation sets up or shapes the outsourcing arrangement in accordance with business needs from the beginning, including outsourcing intent, results of due diligence, contract, and governance arrangement factors to achieve better results both in building the relationship and in driving the outsourcing arrangement.

Clark et al. (1995) warned that any contract has an inherent problem: whenever an agent performs tasks for a principal, the principal is always at risk because the agent may not complete the task as expected or of they may be less cautious than the principal would be. For this reason, Barthelemy (2001) recommended the inclusion of two types of clauses for the IT Outsourcing contract: 1) evaluation clauses relating to the technology that will be employed, the price and scope of the outsourcing contract (e.g. benchmarking clauses) and 2) reversibility clauses relating both to material or human reversibility which also give the organisation the permission to hire employees from the outsourcing vendor. Oh et al. (2006) suggested that mutual monitoring and controlling of provider and customer can prevent future troubles.

Success Factor *3I*: Definition of detailed work plan for the vendor

Relative Importance Ranking: 30

Relative Importance Weight: 3.43

Respondents indicated that this factor had a low level of importance. They indicated that expectations from the vendor should be determined according to a detailed definition of the work plan enabling clear and easy monitoring of the progress and performance of the IT Outsourcing vendor. Holland et al. (1999) and also Wee (2000) claimed that the project should be formally defined in terms of its milestones, critical paths, coordinated training and active human resource.

According to Power, Bonifazi and Desousa (2004), if the work plan and the tasks are well-defined, stipulating the most accurate estimation of required effort, this ensures that the outsourcing strategy is formed into a manageable framework which can be communicated forward, and the expectations from the outsourcing provider are known and acknowledged.

Success Factor *3J*: Alterations of contents and work conditions coordinated with vendor

Relative Importance Ranking: 33

Relative Importance Weight: 2.91

Respondents gave a low rate of importance for this factor. They indicated that the organisation should be aware that requests for alteration of the original requirements and the agreed contents might arise during the project development, and understanding should be achieved with the vendor in order to overcome such cases.

Developing and structuring a robust contract requires commitment of expert resources and a considerable amount of time. The very dynamic era of 'new organisation' requires considerable agility – necessitating the ability to adjust, refocus and reconstruct the development organisation according to the changes in the market, so that there should be an aspect of flexibility in the contract coordinated with vendor. This is in line with the recommendation by Domberger (1998) that the organisation needs flexibility, meaning the ability to make changes in an activity at a fast rate and at low cost.

11.4 Factor Group 4: Working and managerial process with vendor

This group of factors was ranked in fourth and final place. It includes 14 factors:

Success Factor *4A*: Tight cooperation between vendor and the client organisation

Relative Importance Ranking: 3

Relative Importance Weight: 4.58

This factor was rated with a high score by respondents, who indicated that the organisation and the vendor should establish a foundation of understanding and trust, to ensure better cooperation between them. This means that the vendor and the organisation are both involved and have a strong, fluent communication between them so that the development of the project is well controlled.

This finding corresponds with the suggestion of Oza and Hall (2005) that setting up efficient communication tools for information exchange between the outsourcing parties will improve cooperation as expectations at every level need to be communicated. Falkowski, Pedigo, Smith and Swanson (1998) asserted that effective communication is critical to ERP implementation. Akkermans and van Helden (2002) pointed out that interdepartmental cooperation and communication is helpful and beneficial. Chakrabarty, Whitten and Green (2007) concluded that relationship quality (trust, commitment, good communication and cultural fit) has an impact on client satisfaction concerning the outsourcing experience.

Success Factor *4B*: Construction of set-up with decision-making mechanisms

Relative Importance Ranking: 8

Relative Importance Weight: 4.37

Respondents indicated that it was important to establish decision-making mechanisms to conduct the routine work and to overcome obstacles such as unexpected problems during the project which need immediate feedback and resolution. Setting-up an appropriate decision-making mechanism should help to respond to the many challenges regarding the development of the project, with a clear vendor-organisation division of responsibility.

Similarly Power et al. (2004) recommended that a defined plan could ensure that the

IT Outsourcing strategy is formed into a manageable framework of well-defined tasks which can be communicated forward with timelines of the project and with an appropriate decision- making framework.

Success Factor *4C*: Providing the vendor's employees with an empowered sense of identification

Relative Importance Ranking: 9

Relative Importance Weight: 4.35

Respondents gave a high rank of importance to the need to consider the vendor's employees as part of the organisation and not as strangers, since this would improve their motivation to contribute to the organisation. This finding is supported by Kreitner and Kinicki (2007), who indicated that when the vendor's employees are imbued with an empowered sense of identification internal teams become engaged in the overall IT Outsourcing process IT Outsourcing success becomes more probable. When internal teams feel that they are a part of the initiative, they will feel compelled to contribute to the success of the venture (Kreitner and Kinicki, 2007).

Success Factor *4D*: Close escorting of the organisation's 'juniors' by external consultants

Relative Importance Ranking: 10

Relative Importance Weight: 4.24

This factor also received a relatively high importance ranking. Respondents indicated that the organisation should utilise the capabilities and know-how of external providers in order to develop internal IT resources, including internal employee capabilities during the implementation of the ERP system and in further steps of the project. The organisation should therefore appoint internal personnel as 'juniors', who will be trained closely by the consultants and act as the external experts' 'shadows' in each area. This finding is supported by the opinion of Cullen and Willcocks (2003) that organisations have to be very good at managing their relationships with the external consultants since the transfer of knowledge depends on trust and the quality of the relationship.

Success Factor *4E*: Flexibility in the management of consultants, their workloads and tasks and other external resources allowing better control and supervision.

Relative Importance Ranking: 13

Relative Importance Weight: 4.21

This factor indicates that IT Outsourcing provides operational flexibility for the benefit of the organisation; allowing the organisation access to the required skills, as and when they are required, and calling on the vendor's resources for highly specialised skills and/or in unusual situations. Improved flexibility is good for the organisation (Rouse, Corbitt and Aubert, 2001).

Success Factor *4F*: Creation of common vendor-client organisation approach (WIN-WIN)

Relative Importance Ranking: 16

Relative Importance Weight: 4.07

Respondents felt it was important to coordinate the approaches of the organisation and the vendor in order to produce a "Win-Win" situation where both sides are satisfied and gain the best outcome from the business and social relationship. This finding is supported by the finding of Chakrabarty, Whitten and Green, (2007) that the quality of the vendor-organisation relationship is an important contributor to a successful outsourcing arrangement for both parties.

Success Factor *4G*: Vendor's stipulation to ensure fair and proper work conditions for own employees.

Relative Importance Ranking: 17

Relative Importance Weight: 4.03

The respondents indicated that the organisation wants to obtain the best services from the vendor's employees. This factor is also mentioned by Cleland and Ireland (2006) as the organisation's concern that the vendor's employees will have fair and proper work conditions provided by the vendor, so that they will have congenial feelings and their attitude toward the project.

Success Factor *4H*: Assimilation of the vendor within the organisation's culture

Relative Importance Ranking: 22

Relative Importance Weight: 3.66

Respondents indicated that the vendor and its team need to learn to cope according to the client's organisational culture. Ravasi and Schultz, (2006) presented similar results, describing the organisational culture as a set of shared mental assumptions that guide interpretation and action in organisations by defining appropriate behaviour for various situations. If the vendor's employees act and communicate according to this culture they will achieve more successful communication and become involved according to the common values, customs, traditions, and meanings that prevail within the customer organisation. When the vendor recognises important features of the customer's culture and acts in ways that are compatible with it, mutual collaboration and better results ensue (Kreitner and Kinicki, 2007).

Conversely, Young (2008) noted that a cultural clash between vendor and customer organisation is a significant factor that can jeopardise the outcome of the outsourcing initiative.

Success Factor *4I*: Effective management of 'surprises' and unanticipated incidents

Relative Importance Ranking: 23

Relative Importance Weight: 3.65

Respondents gave a low importance ranking to this factor but they indicated that management should be able to provide suitable responses to unexpected problems such as diversion from the planned schedule in order to overcome such events.

In order to help management to cope with this issue, Somers and Nelson (2001) suggest that clear definitions of goals and management of expectations would improve ability to deal with unexpected incidents. The organisation should provide the best project management for the implementation of the project not only in the business or technical sense but also with regard to their psychological consideration of employees, providing encouragement and support (Mandal and Gunasekaran, 2003).

Additionally they should closely supervise 'surprises' in order to continue to comply with the budget and timetables.

Success Factor *4J*: Vendor works according to systematic methodology of project management

Relative Importance Ranking: 26

Relative Importance Weight: 3.56

Management of an ERP implementation project is somewhat different to the management of any other IT project (Adam et al., 2005). This factor was awarded a relatively low level of importance. Respondents indicated that if the provider uses a proven and well-practised systematic methodology for the project management this can have a positive impact on the development and achievements of the project. Weston (2001) considered issues involved in the development stages that the project passes through, associated metrics, and the software used in ERP implementations as factors that influenced the application and modification of existing project management techniques to new ERP systems.

Success Factor *4K*: Construction of mechanism for supervision and control of progress.

Relative Importance Ranking: 27

Relative Importance Weight: 3.54

Respondents indicated that it is important (although at a relatively low level of importance) to supervise and control the project's progress in order to ensure that a project stays on track and if necessary, they should take corrective action. This necessitates the construction of a proper control mechanism which is acceptable by both the vendor and the organisation and clarifies their responsibilities in regard to the performance and progress. Implementation progress must be measured regularly for more efficient and effective control.

This factor differs from Factor 4B above which relates to the need for a mechanism that will divide responsibilities between the organisation and vendor. Here the mechanism relates to control of the process,

Monitoring and evaluating of performance is also discussed in the literature, which indicates that these strategies provide a foundation for tracking and controlling (Kuang et al. 2001). Gefen, et al. (2008) suggested that there should be an agreed mechanism for cooperation between vendors and the organisation representatives with well detailed policies and clear guidelines for the supervision and control of progress and the measures used to determine success. Milestones and targets are important to keep track of progress. For these purposes reporting should be efficient (Klaus et al., 2000; Ross and Vitale, 2000).

Success Factor *4L*: Correct calculation of hidden costs in advance

Relative Importance Ranking: 29

Relative Importance Weight: 3.46

Respondents indicated that it is important to predict and calculate hidden costs, in order to succeed in performing the project with all the known and expected costs within the predetermined budget.

Similarly Barthélemy (2001) suggested that organisations should be aware that IT Outsourcing contributes to four types of hidden costs: 1) vendor search and contracting, 2) transition to the vendor, 3) managing the effort, and 4) transitioning after outsourcing. Some common hidden costs of ERP projects were identified by Koch and Wailgum (2008) as: IT staff increase, training expenses (which are high because workers almost invariably have to learn a new set of processes, not just a new software interface), testing the links between ERP packages and other corporate software links (that have to be built on a case-by-case basis and which are another often-underestimated cost), integration costs of add-ons for the ERP, customisations that can affect every module of the ERP system (because they are all so tightly linked together), and underestimation of moving costs of corporate information from old systems to new ERP (such as customer and supplier records). These items should all be considered and carefully quantified when developing the project budget.

Success Factor *4M*: Vendor undertakes to conduct training, guidance and instruction of in-house replacements

Relative Importance Ranking: 31

Relative Importance Weight: 3.43

This factor was awarded a low importance rating by the respondents. The factor relates to the responsibility of the vendor to transfer information through education and training about the organisation's ERP system to the organisation's IT employees, the users, especially in when an external consultant needs replacing.

Several researchers have indicated the need for education and training of in-house staff during the employment of IT Outsourcing processes (Trimble 2000; Somers and Nelson, 2001). The organisation should have a clear educational strategy concerning the ERP implementation that sets out routines for early hands-on training for the employees (Al-Mashari et al, 2003; Mandal and Gunasekaran, 2003).

Success Factor *4N*: Adding external independent consultants to ERP project manager

Relative Importance Ranking: 32

Relative Importance Weight: 3.32

The ERP project manager reports to top management and/or the steering committee of the organisation's ERP implementation project (depending on the predetermined structure). Respondents indicated that the addition of external independent consultants could provide support to the ERP project manager if they provide the right answers for the specific project implementation conditions, but care is necessary to suggest solutions in the best interests of the organisation and without any attempt to comply with foreign interests. Involving independent consultants in the implementation allows the organisation to benefit from experienced individuals with different approaches to the project (Skok and Legge, 2002; Mandal and Gunasekaran, 2003).

11.5 Summary

This chapter discussed the success factors for the employment of IT Outsourcing in the implementation and maintenance of ERP projects in Israel that emerged from the qualitative and quantitative research findings. The findings were presented according to identified groups and each constituent factor was sorted by its relative importance ranking.

The discussion described the meaning of the findings and then compared them to previous knowledge in the relevant fields.

Section 7: Conclusions

Preview

This section presents conclusions drawn from the discussion of the qualitative and quantitative findings presented in Chapters 10 and 11. Initially, evidence was collected regarding disparate existing perceptions of IT Outsourcing and ERP projects from different sources: the literature, practising IT managers, and their employees. These sources helped to formulate the research purpose and in the composition of specific research questions.

The section will consider how well the research questions have been answered and what remains unclear, offering a critique of the research and suggesting its applicability within other similar contexts. It will also indicate possible contributions from this research to the extant corpus of knowledge in the relevant fields.

Section 7 ends with an epilogue which provides a personal prism on my learning and personal development through the research process and the writing of this doctoral thesis.

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Chapter 12: Conclusions

The shift that has taken place in many organisations from separate stand-alone legacy IT systems to cross-organisational integrated ERP systems engenders new dilemmas and necessitates new paradigms. The research focused on the employment of IT Outsourcing to assist organisations to implement and maintain ERP systems. In the past, academic studies in the relevant fields of knowledge investigated IT projects with no special reference to cross-organisational ERP systems; while studies that investigated ERP systems did not specifically consider the employment of IT Outsourcing to implement and maintain ERP systems. Despite certain similarities between the findings of this research and those of the previous partially relevant studies, differences can be seen providing new insights that justify this study.

In order to discover how to successfully employ IT Outsourcing in ERP projects, this research used extant literature and the perceptions of the respondents to identify success factors for these processes. The success factors thus identified were similar to those that emerged from previous research concerning the use of IT Outsourcing in IT projects in general. Nevertheless it seems that the centralised and cross-organisational nature of an ERP project means that more emphasis is given to factors such as management involvement, and the requirement for a well-managed implementation with intensive support and maintenance by experienced professionals with past success records in other sites.

Section 12.1 below draws conclusions regarding the findings for each of the research questions.

12.1 Answering the research questions: Conclusions

12.1.1 What are the reasons for IT Outsourcing in ERP projects in Israel?

- The main reason for the employment of IT Outsourcing in ERP projects is to substantially improve the organisation's chances of success by using external experienced professionals. Such support will help to compete with the implementation of a difficult and complicated mission which is seen as crucial for the wellbeing of the entire organisation. Failure can sometimes lead to the dysfunction of the organisation and irreversible damage. The use of specialist

expertise, which is unlikely to exist within the organisation, is seen as a way to reduce these considerable risks whilst increasing the positive benefits to be gained from ERP systems. Nevertheless the research shows that it is important to construct a mixed team of inside people with outside experts to maintain knowledge within the organisation and reduce dependence on external entities.

- The findings show that other strong motivations for IT Outsourcing relate to the Technological and Strategic aspects of the implementation of ERP systems, striving to achieve a successful and robust working ERP system. These systems represent advanced technology and also reflect what is believed by their developers to be best practice in organisational functions. Both these elements are likely to be new and untried in the client organisations but familiar to the outside experts, explaining the motivation to rely on specialist support for implementation.

- In contrast to traditional legacy systems, ERP is a cross-organisation package affecting the organisation's most important activities, and critical to its success, therefore it is considered unacceptably risky to implement this system without the support of the finest experts and the most trustworthy technology. Although this reason for IT Outsourcing can be found in literature relating to general IT projects, the weight that this factor was given in the present findings for ERP projects was far more crucial and significant.

- In contrast to legacy systems, the assistance of IT Outsourcing is seen as essential for successful implementation of ERP systems and the question is not whether to outsource but how to employ outsourcing in an optimal manner.

- Despite the findings of Kern et al. (2002) that the most common drivers for employing IT Outsourcing are financial: reducing costs, obtaining immediate cash, replacing capital outlays with periodic payments, the responses of the respondents in the two stages of the research showed that 'cost reduction', is less relevant as a motivation to outsource when speaking about ERP. At least in the short term, outsourcing for ERP implementation was perceived to be a rather expensive and not cost-saving experience. Still, this does not contradict the common understanding that the organisation will be motivated by the aspiration that IT Outsourcing should lead to overall economic benefits, achieved through

improved efficiency across all aspects of the organisation's operations over the medium to long term.

12.1.2 How and to what extent does the use of IT Outsourcing within ERP projects, differ from outsourcing in traditional software projects?

- The essential difference is that an ERP project is a cross-organisational system that affects most aspects of the strategic and the day-to-day activities. This requires a centralised professional management. IT Outsourcing experts are involved in confronting the main workflow processes and not just the local relatively small module as in legacy systems.
- This is of great importance and value in ERP which is a generic package implemented in other sites, and the IT specialists vendors should come with past experience and success record implementing the ERP modules in those sites
- Care should be taken in the choice of vendors who are not simply technical experts, ensuring that they have a deep understanding of the way the technology will support the organisation's operations: acquired through experience of working in many different client organisations, not simply knowing what the system will do, but also how, and very significantly, why.

12.1.3 The main research question: What are the success factors for selective IT Outsourcing within ERP projects in Israel?

Four groups of success factors for the implementation and maintenance of ERP systems with the assistance of IT Outsourcing were identified by the research:

- Top management Factors: The commitment, involvement and endorsement by the organisation's Management, both for project development management and for coordinating collaborative organisation-vendor work: Management has to lead, motivate and be involved in planning and controlling the project, as ERP is such a critical matter at all levels of the organisation.
- Strategic and organisational factors - overcoming resistance within the organisation to the employment of IT Outsourcing and to the implementation of ERP systems before the project begins, and during the project life-cycle.
- Selection and employment of external expertise (outsourcing) to close technology and managerial gaps is essential for success of an ERP project. Since most

leading ERP packages are being continuously improved and changed and to keep up to date with innovations, organisations must have the support of those that implement these systems on a regular basis, learning and adopting the state-of the art developments of new software packages in other sites.

The studied organisations did not have the necessary internal resources to successfully implement and maintain ERP systems. Since ERP is large-sized package-based generic enterprise software only IT Outsourcers have sufficiently deep understanding of business processes and what to customise and what to keep from the original features of the ERP package. The experienced experts usually cannot be found in-house as in-house staff has no previous experience of ERP systems.

- Close cooperation with the right vendor: Selecting the right vendor and having effective Organisation-Outsourcing Vendor's interaction using adequate working and managerial procedures, prudent contract terms, good working relationships, communication and trust. This is essential for success. When both parties know what they expect from each other, when there is commitment, coordination, interdependence and trust in place, problems are solved together, information is shared, the quality of the work has a high value and both parties are satisfied with the relationship and its results – then the relationship has the ingredients to engender success.

The first two groups relate to the internal structure of the organisation and depend on the organisation's behaviour, while the latter two groups depend on external conditions and relations with the outsourcing service providers so that poor communication, lack of trust, poor up-front planning, lack of shared goals, poor relationship management, and unsatisfactory performance are all potential reasons for failure (Tuten and Urban, 2001).

12.2 Factual and conceptual conclusions: Summary

Table 12.2 below summarises factual and conceptual conclusions that emerged from the analysis of the findings. The conclusions are presented in comparison to the consideration of the issues in existing literature.

Table 12.1 Summary of the factual and conceptual conclusions

Observations / Outcomes	Consideration in Existing Literature (As referenced in the thesis)	Researcher's Reasoning	Conclusions from the findings of Current Research
The research investigated reciprocal relations between IT Outsourcing and ERP phenomena	Although there is a very extensive body of literature on the issue of IT Outsourcing, ERP is hardly mentioned at all, and vice versa most articles relating to ERP do not relate specifically to the relationship between ERP and IT Outsourcing	The interaction between these huge prevalent phenomena is crucial to an organisation's success in today's competitive markets	Strong reciprocal relations were found between these two phenomena
IT Outsourcing is a MUST in an ERP project	The decision to outsource depends on a list of identified motivations.	ERP is a critical component for an organisation, It is a cross-organisational, complicated system	Definitely positive confirmation that ERP is an essential component for any organisation. The question is only how should it be implemented and maintained.
External expertise is essential to ensure that the organisation can successfully close technological and managerial gaps created by rapid developments in the IT field	This finding resembles other findings concerning motivations for outsourcing in extant literature. However, previous literature rarely related specifically to the need to outsource for the implementation and maintenance of ERP systems	ERP is critical to the organisation's ability to survive, Its cross-organisational, complicated system needs expertise for implementation and maintenance that usually does not exist within the organisation.	The need to outsource in order to attain the necessary expertise for implementation and maintenance of ERP systems emerged as the strongest most important reason to outsource

Observations / Outcomes	Consideration in Existing Literature (As referenced in the thesis)	Researcher's Reasoning	Conclusions from the findings of Current Research
The desire for a successful robust ERP system is far more important than the desire to reduce costs hence, Cost-Reduction is not a major reason to outsource	A "common wisdom" in many of researches is that cost-reduction is the first reason to outsource	ERP is a critical system with strategic significance	The technological and strategic aspects of ERP systems' implementation and maintenance constitute the most important motivations to outsource. This was confirmed by results of both Questionnaires and Interviews
Other motivations for IT Outsourcing mentioned in the Literature	The motivations mentioned refer to the use of IT Outsourcing in general software projects	Many motivations for IT Outsourcing mentioned with regard to IT systems in general hold true with regard to motivation for employment of IT Outsourcing in ERP projects	Confirmed by results from the Questionnaires and Interviews
Other attributes for ERP mentioned in Literature relating to the issue of best practice	The attributes refer to the ERP development workforce with no special reference to external vendors' support	Many success factors of ERP are also valid when measuring the success of IT Outsourcing involvement in ERP	Confirmed and validated by the responses to the Questionnaires and Interviews

12.3 Critique and Limitations of this Research

12.3.1 Research boundaries

Since the subjects under study in this research are so intermeshed with other close issues such as the organisation's IT's policy, worldwide software trends, and client-vendor relations, there was continually a temptation to include more and more issues within this study. I decided to resolve this dilemma by focusing on what were considered to be the real innovative concepts concerning the integration of IT Outsourcing within ERP. Other points, such as offshore outsourcing, Business Process Outsourcing (BPO) were excluded from the study.

The nature of the IT world is dynamic and innovative with rapid development. Catching up with all the innovations and the new technology is a very difficult task especially when searching for relevant and 'fresh' literature. I therefore combined fundamental well-practised theories with the newest approaches that could be found. My involvement in professional forums helped me to access the most recent resources and knowledge.

The research was undertaken within organisations in Israel, who adopted the ERP systems and used outsourced processes. This constituted a limitation since it is uncertain whether the findings would apply in other contexts; however it offers insights concerning a little known research field within this country.

12.3.2 Bias due to the characteristics of qualitative research

Some of the limitations of the research were influenced by its very nature as a primarily qualitative research (applied in Stage One). As noted in the literature, the strengths of a qualitative research are also its weaknesses. For example: it concentrates on producing a rich subjective description of the studied phenomenon but this very fact means that it is very specific to the particular phenomenon that it studies and cannot be easily generalised to other situations. Therefore, the research has certain inherent biases.

The level of truthfulness of respondents' answers in semi-structured interviews may be dubious. Respondents may be subject to the effects of social desirability. They may wish to provide what they understand to be the 'right' answer due to the reactions of the interviewer, in order to show themselves in a positive light. As a result, the data would be distorted. In order to overcome this, the researcher

addressed this point at the outset of each interview, explaining the significance of genuine data, in order to make the respondents aware of the importance or 'real' reactions and responses and explaining that any response would be considered the 'right answer'. When people know that they are being studied and observed, their natural reactions change. As described in the methodology section, these weaknesses were minimised by adopting the recommendations of Bryman (2004) to overcome social desirability effects, not being overtly friendly with the respondents and not being judgmental about their responses. I also assured the respondents that the research material would be confidential and that their identity would remain anonymous.

Some of the respondents were my clients, while some might be potential clients, others were my colleagues. I was aware that this could impose a limitation on the data obtained and therefore explained that the data would not be passed on to the organisations in which the respondents were employed nor would it affect the continuation of the relationship with clients.

12.3.3 Researcher bias

Throughout the research I was aware that my personal and professional experience and background helped to shape my point of view and my own input into the research. In order to overcome any possible 'researcher bias' I frequently consulted the relevant literature and employed the services of a professional statistician and other experts in field practice in order to minimise my subjective interpretations of the data. Triangulation was used in the research as a strategy to corroborate qualitative data with quantitative data and to increase confidence in the validity of the findings, and to reduce bias. I was continually aware of possible influences of my opinions on the interpretations and conclusions and constantly took this into account when reflecting on the analytical process. All steps of the field work and the analysis were carefully recorded in order that it would be possible to check and re-check these processes.

12.3.4 Limitations of the quantitative data

The closed-ended questionnaire used the commonly accepted odd numbered five-point Likert scale. A benefit of this strategy is that questions are usually easy to understand and so lead to consistent answers. However, as noted by Cohen et al.

(2001), the problem is that selection from a few options may not allow respondents to express opinions that are not fully represented. An additional problem can occur when people become influenced by the way they have answered previous questions. For example if they have agreed several times in a row, they may continue to agree. They may also deliberately break the pattern, disagreeing with a statement with which they might otherwise have agreed. In order to overcome these phenomena, the researcher carefully set the options of questions or statements so that they acted together to give a useful and coherent picture, asking some questions in reverse form, although this can cause bias and hence needs great care.

12.3.5 Generalisability of the findings

According to Schofield (1993) generalisability is difficult to achieve in qualitative research as numerous characteristics of qualitative research are not compatible with external validity, because unlike quantitative research the concern of qualitative research is to illuminate one specific human phenomenon or situation.

Triangulation was performed in order to increase the level of generalisability of the research findings, to corroborate the data gathered through the two qualitative methods with the quantitative closed-ended questionnaire and to reinforce and validate the findings. The triangulation produced a rich and thick description of the two phenomena, IT Outsourcing and ERP, (relating to success factors, and reasons to outsource) that was employed in the discussion of the research questions providing greater confidence for the research findings. Thus, triangulation increased the rigour of the data analysis, enhancing its generalisability. Nevertheless the research was conducted in the Israeli environment, and was rooted within the Israeli reality, and reflects this specific context. Although this may limit their generalisability, readers are invited to test the applicability of the findings to their own particular circumstances especially in other ERP projects outside Israel.

12.4 The Contribution to Knowledge

Despite the increasing employment of IT Outsourcing and the fact that ERP systems play a pivotal role in the performance of many organisations, research concerning IT Outsourcing has mostly targeted the employment of this resource in the context of traditional IT systems and only limited research literature has tried to investigate the reciprocal relations between IT Outsourcing and ERP (Dibbern et al., 2002; Wu et

al., 2004). A comprehensive survey of IT Outsourcing literature (Dibbern, 2004) found ample knowledge about IT Outsourcing, and related issues but most of the articles and theories and researches in this field lack the keywords ERP or "Enterprise Resource Planning". Conversely, a comprehensive literature review (Young and Moon, 2007) of more than 300 articles on ERP, found none which referred to IT Outsourcing. The research undertook to fill the consequent gap in extant knowledge concerning the employment of IT Outsourcing in the implementation and maintenance of ERP systems.

The research identified success factors for the implementation and maintenance of ERP systems with the assistance of IT Outsourcing.

Four major groups of success factors were identified that can be used to measure the success of the implementation of ERP projects with the assistance of IT Outsourcing as noted in the conclusions presented in sub-section 12.1. Many of these success factors had already been identified for ERP projects in the past, as discussed in section 4.2.5 of Chapter 4. But in this research, the emphasis on the role of IT Outsourcing in establishing this particular type of project led to the highlighting of certain success factors and the diminishment of the importance of other factors in contrast to previous lists of success factors for ERP projects.

Additionally, this thesis added two further contributions:

1. An original contribution to knowledge is made by offering a better understanding of the unique phenomenon of IT Outsourcing within ERP projects in Israel, enhancing the understanding of different motivations for use of IT Outsourcing when ERP systems are involved instead of traditional IT systems. Given the very limited research literature that exists on the confluence of IT Outsourcing with ERP, as opposed to the rich literature existing on each subject separately this is a salient contribution.

2. Secondly the results clearly indicate that when considering the issue of IT Outsourcing, IT systems cannot be considered as a homogenous unit. There are clear differences between the different IT systems and these differences have consequences for the employment of IT Outsourcing services. This appears to be a novel approach to the study of IT Outsourcing that may be useful for future research in this field.

12.5 Propositions for further research

The current research focused on IT Outsourcing concentrating on one of the main emerging IT data processing and operation fields in the organisational environment: ERP. Although the research was conducted in the Israeli context, the insights that were gained here may be useful in the measurement of success of IT Outsourcing for ERP projects in similar contexts in other countries and provide background information for future studies in these fields.

The research indicated that the specific characteristics of ERP systems shape and have consequences for IT Outsourcing and the relationship between the company and IT Outsourcing. These conclusions point up a need to investigate whether other new technologies such as data analytics, Cloud Computing and Agile methods of project development have a similar or other effect on IT Outsourcing and the IT Outsourcing-organisation relationship. It also seems pertinent to develop new paradigms to understand internal and external collaboration regarding the implementation of these projects in organisations. Further issues for investigation in the IT Outsourcing-ERP domain, might relate to the trade-off between outsourcing and customisation (i.e. the degree to which the ERP package is adapted to internal business processes), questions concerning the usage of IT Outsourcing at the different stages of the project life-cycle, and the role of users' groups and forums.

It would also be useful to compare the perceptions of ERP success factors of employees with those of managers or to compare the perceptions of the organisation with those of the outsourcing providers. This issue was not considered in this research but its relevance emerges from the important role of the outsourcing vendor as performance and the involvement of the vendor are crucial factor for the ERP success.

Epilogue

The work presented in this thesis was carried out from the end of 2004 until 2010 at the Anglia Ruskin University in parallel to my full time work as an IT professional in Israel. This was a period of serious undulations in the economy in general and in the IT industry in particular, that affected the speed of my research progress, but also contributed to some of my insights and basic understandings as a result of real life occurrences.

As a professional working in IT Outsourcing in ERP projects in Israel, I reached the unequivocal conclusion that these two phenomena are reciprocally interrelated because all ERP projects that I encountered or heard about involved intensive involvement of external software vendors, often as the leaders responsible for the ERP system's day-to-day implementation. Conversely, I never encountered or heard of any major IT vendor who had not been intensely involved in ERP projects. i.e. every ERP project employs an external outsourcing vendor, and each large vendor in Israel employs a strong and active skilled staff and knowledge base that compete in this IT category: ERP has spread like a prairie fire in the last decade and has been implemented in more than 80% of organisations with over 200 workers in Israel, so that ERP projects actually constitute the most prevalent IT projects "in town" and in order to stay in the scene, all the large IT vendors have been forced to aggressively enter this field.

This issue intrigued me and I began to try to find out how this real life fact was mirrored in literature and searched for its trails in both IT Outsourcing and ERP studies. To my great astonishment these two phenomena were mentioned together in very few literary sources and I could only find a very few articles that tried to connect the two phenomena in an organic way (there were some that mentioned 'vendors' in ERP projects). Surprisingly enough, this is still true today. This was a ground-shaking revelation for me and strengthened my determination to clarify the interrelation between these two phenomena and to attempt to produce insights which would be useful for those working in this field. My findings gradually emerged and formed a clearer picture of the difficulties encountered by organisations in the implementation and maintenance of ERP systems and the role of IT Outsourcing in facilitating and supporting these processes. Hopefully I have made a modest

contribution to the literature in this field and have produced understandings that can assist organisations endeavouring to implement ERP systems. I hope also that this thesis will be read and noticed and that it will inspire others to continue to investigate this significant field.

During this process I have learned a lot, gained more familiarity with my field of work, but even more important - I have been encouraged by my dedicated mentors to develop my research skills and scientific methodology, maintaining high standards that start with knowing how to prioritise the essence out of the raw data and to present the core truth in a readable and precise way.

From the research perspective, the work on the research enhanced my skills and experience with both theoretical and practical implications, learning how to use a variety of research tools, and how to identify basic patterns and different concepts and components, to integrate them and to construct a synthesised innovative explanatory model. I became acquainted with the research philosophies that produced the various research methodologies: at first I found it challenging to understand them as they were completely unfamiliar disciplines for me, but this was fully compensated by my great excitement when I revealed new perceptions that hopefully will be valuable to others. Applying those methodologies throughout the planning of the questionnaires, the practical field work and the analysis stage provided me with a more comprehensive picture of what a researcher should do, and hopefully have led to the successful achievement of my research goals.

On a more personal note - conducting this research provided me with an opportunity for self-fulfilment and self-discovery; I managed to improve myself as a professional and a person. Through this research I learned about my abilities and capabilities, as well as about my limitations and drawbacks and I am glad to say that my studies and my ability to overcome many of the intellectual challenges involved have helped me to enhance my self-esteem and my confidence in my abilities as an intellectual.

I hope that this document will serve as an inspiration for many more intellectual journeys.

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Appendix 3.1: Theories relating to IT Outsourcing

The following table shows additional features of the different theories relating to IT Outsourcing research

Table 1: Overview of Theories relating to IT Outsourcing Research
(Source: Dibbern et al., 2004)

Theoretical Concept	Level Basic of Analysis	Assumptions	Main Variables	Major Authors
Economic Theories				
Agency Theory	Organisational	Asymmetry of information, differences in perceptions of risk, uncertainty	Agent costs	Jensen and Meckling (1976)
Transaction Cost Theory	Transaction	Limited rationality	Transaction costs opportunism production costs	Coase (1937), Williamson (1975,1981,1985)
Social Theories				
Power and Politics Theories	Individual, Organisational	Power, idiosyncratic interests and politics play major roles in organisational decision-making	Different degrees of power organisational politics	Pfeffer (1981, 1982), Markus (1983)
Relationship Theories	Organisational	Parties in the relationship assume that the outcome of a relationship is greater than achieved by individual parties separately	Cooperation, interactions, social and economic exchanges	Klepper (1995) Kern (1997),
Social Exchange Theory	Individual, Organisational	Participation in exchange occurs with the assumption Of rewards and obligation to return rewards	Exchange of activities benefits/costs, reciprocity, balance cohesion , power in exchanges	Homans (1961) Blau (1964), Emerson (1972),

Theoretical Concept	Level Basic of Analysis	Assumptions	Main Variables	Major Authors
Strategic Theories				
Resource Theories	Organisational	An organisation is a collection of resources, and resources are central to an organisation's strategy	Internal resources, resources in the task environment	Penrose (1959), Thompson (1967) Pfeffer and Salancik (1978), Barney (1991)
Strategic Management Theories	Organisational	Organisations have long-term goals and they plan and allocate resources to achieve these goals	Strategic advantage strategies, choice of individuals	Chandler (1962), Miles and Snow(1978) Porter (1985),

Appendix 4.1: Benefits of ERP

Table 1: Benefits of ERP by aspects

Source: Proposed enterprise system benefits framework (Seddon et al., 2003, p. 79)

Operational benefits: By automating business processes and enabling process changes, ERP services can offer benefits in terms of cost reduction, cycle term reduction, productivity improvement, quality improvement, and improved customer service.
Managerial benefits: With centralised database and built-in data analysis capabilities, ERP services can help an organisation achieve better resource management, improved decision making and planning, and performance improvement
Strategic benefits: With large-scale business involvement and internal/external integration capabilities, ERP services can assist in business growth, alliance, innovation, cost, differentiation, and external linkages.
IT infrastructure benefits: With integrated and standard application architecture, ERP services support business flexibility, reduced IT cost and marginal cost of business units' IT, and increased capability for quick implementation of new applications
Organisational benefits: ERP services affect the growth of organisational capabilities by supporting organisation structure change, facilitating employee learning, empowering workers, and building common visions.

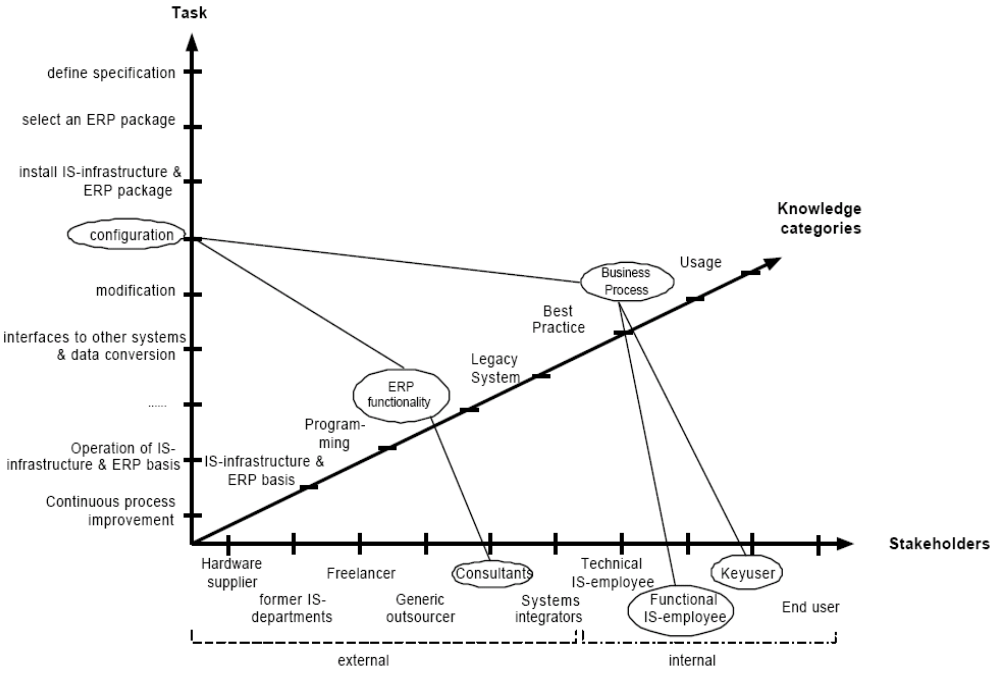
Appendix 4.2: The ERP System Lifestyle

Table 1: Knowledge categories in the ERP system lifecycle

No.	Knowledge Attribute	Task type	Description
1	IT-Infrastructure and ERP Basis	Technical	Hardware and basic services of the ERP package, depends upon the IS infrastructure and the ERP package used.
2	Programming	Technical	The programming language of the ERP package (e.g., ABAP/4 in SAP R/3) and the architecture of the ERP software. The only way to modify the ERP package or produce specific process or reports.
3	ERP-Functionality	Functional	Refers to the functionality available in ERP software packages that reflects the reference processes depicted in the software. It includes knowledge of the full range of parameters and their configuration settings.
4	Legacy-System	Functional	Refers primarily to custom-developed applications. During ERP implementation, data from the old system is often converted. It is also possible that the Legacy-Systems continue to work together with the ERP system productively.
5	Best-Practice	Technical/ Functional	Relates to the best standard procedure for business processes and the appropriate organisational structure within an industry or business type.
6	Business Process	Functional	Includes the unique manner in which business processes are performed within an individual organisation. It is often attributed to an individual or a group within the organisation and involves a high degree of knowledge from experience.
7	Usage	Functional	The correct use of the ERP applications. It is acquired by end users primarily through training and learning-by-doing and often accessible in application documentation.

Appendix 4.3: Framework of ERP Tasks and Stakeholders

Figure 1: Classification framework of tasks and stakeholders
(Source: Dibbern et al., 2002)



Appendix 4.4: The overall role of the ERP community players

Somers and Nelson (2004) explored the following important questions:

- Which central players and activities play a pivotal role in an organisation's experience with the ERP implementation?
- At which stage of the implementation process is it critical for an organisation to introduce a central player or activity in order to derive major benefits?

In response to these questions they produced the following chart, Table 1 that relates to the expected importance of players and activities across implementation stages: the assessment of expected importance is based on their literature review: high (H) 0.60; medium (M) 0.30; low (L) 0.10 (Somers and Nelson, 2004).

Table 1: Expected importance of players and activities across implementation stages

Players and activities (P & A)		ERP implementation stages					
		Initiation	Adoption	Adaptation	Acceptance	Reutilization	Infusion
P	Top management	H	H	H	H	H	H
P	The project champion	H	H	H	H	M	M
P	The steering committee	H	H	H	H	L	L
P	Implementation consultants	H	H	H	M	L	L
P	The project team	H	H	H	H	L	L
P	Vendor–customer partnership	H	H	H	H	M	L
P	Vendors' customisation tools	L	H	H	L	L	L
P	Vendor support	L	L	L	M	H	H
A	User training and education	H	H	H	H	M	L
A	Management of expectations	H	H	H	H	M	L
A	Careful package selection	H	H	L	L	L	L
A	Project management	H	H	H	H	M	L
A	Customisation	H	H	H	L	L	L
A	Data analysis and conversion	H	H	H	M	L	L
A	Business process reengineering	H	H	H	M	L	L
A	Architecture choices	H	H	M	L	L	L
A	Dedicating resources	H	H	H	H	M	L
A	Change management	L	H	H	H	M	L
A	Clear goals and objectives	H	H	H	H	H	H
A	Education on new business processes	L	H	H	H	M	L
A	Interdepartmental	H	H	H	H	M	L
A	Interdepartmental cooperation	H	H	H	H	M	L

Appendix 7.1: Strengths and Weaknesses of Different Research Methodologies

Table 1: Comparative strengths and weaknesses of qualitative research

(Source: R. Burke Johnson and Anthony J. Onwuegbuzie (2004) Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, Vol. 33, No. 7, pp. 14–26)

Strengths	Weaknesses
▪ The data are based on the participants' own categories of meaning. ▪ It is useful for studying a limited number of cases in depth. ▪ It is useful for describing complex phenomena. ▪ Provides individual case information. ▪ Cross-case comparisons and analysis are possible. ▪ Provides understanding and description of people's personal experiences of phenomena (i.e., the 'emic' or insider's viewpoint). ▪ Can describe, in rich detail, phenomena as they are situated and embedded in local contexts. ▪ The researcher identifies contextual and setting factors as they relate to the phenomenon of interest. ▪ The researcher can study dynamic processes (i.e., documenting sequential patterns and change). ▪ The researcher can use the primarily qualitative method of "grounded theory" to generate inductively a tentative but explanatory theory about a phenomenon. ▪ Can determine how participants interpret "constructs" (e.g. self-esteem, IQ). ▪ Data are usually collected in naturalistic settings in qualitative research. ▪ Qualitative approaches are responsive to local situations, conditions, and stakeholders' needs.	▪ Knowledge produced may not generalise to other people or other settings (i.e., findings may be unique to the relatively few people included in the research study). ▪ It is difficult to make quantitative predictions. ▪ It is more difficult to test hypotheses and theories. ▪ It may have lower credibility with some administrators and programme commissioners. ▪ It generally takes more time to collect the data when compared to quantitative research. ▪ Data analysis is often time consuming. ▪ The results are more easily influenced by the researcher's personal biases and idiosyncrasies.

Strengths	Weaknesses
▪ Qualitative researchers are responsive to changes that occur during the conduct of a study (especially during extended fieldwork) and may shift the focus of their studies as a result. ▪ Qualitative data in the words and categories of participants lend themselves to exploring how and why phenomena occur. ▪ One can use an important case to vividly demonstrate a phenomenon to the readers of a report. ▪ Determine idiographic causation (i.e., determination of causes of a particular event).	

Table 2: Comparative strengths and weaknesses of quantitative research

(Source: R. Burke Johnson and Anthony J. Onwuegbuzie (2004) Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, Vol. 33, No. 7, pp. 14–26)

Strengths	Weaknesses
▪ Testing and validating already constructed theories about how (and to a lesser degree, why) phenomena occur. ▪ Testing hypotheses that are constructed before the data are collected. Can generalise research findings when the data are based on random samples of sufficient size. ▪ Can generalise a research finding when it has been replicated on many different populations and subpopulations. ▪ Useful for obtaining data that allow quantitative predictions to be made. ▪ The researcher may construct a situation that eliminates the confounding influence of many variables, allowing one to more credibly assess cause-and-effect relationships. ▪ Data collection using some quantitative methods is relatively quick (e.g. telephone interviews). ▪ Provides precise, quantitative, numerical data. ▪ Data analysis is relatively less time consuming (using statistical software). ▪ The research results are relatively independent of the researcher (e.g. effect size, statistical significance). ▪ It may have higher credibility with many people in power (e.g. administrators, politicians, people who fund programmes). ▪ It is useful for studying large numbers of people.	▪ The categories used by the researcher may not reflect local constituencies' understandings. ▪ The theories used by the researcher may not reflect local constituencies' understandings. ▪ The researcher may miss out on occurring phenomena because of the focus on theory or hypothesis testing rather than on theory or hypothesis generation (called the confirmation bias). ▪ Knowledge produced may be too abstract and general for direct application to specific local situations, contexts, and individuals.

Table 3: Comparative strengths and weaknesses of mixed-methods research

(Source: R. Burke Johnson and Anthony J. Onwuegbuzie (2004) Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, Vol. 33, No. 7, pp. 14–26)

Strengths	**Weaknesses**
▪ Words, pictures, and narrative can be used to add meaning to numbers. ▪ Numbers can be used to add precision to words, pictures, and narrative. ▪ Can provide quantitative and qualitative research strengths (i.e., see strengths listed in Tables 3 and 4). ▪ Researcher can generate and test a grounded theory. ▪ Can answer a broader and more complete range of research questions because the researcher is not confined to a single method or approach. ▪ The specific mixed research designs discussed in this article have specific strengths and weaknesses that should be considered (e.g., in a two-stage sequential design, the Stage 1 results can be used to develop and inform the purpose and design of the Stage 2 component). ▪ A researcher can use the strengths of an additional method to overcome the weaknesses in another method by using both in a research study. ▪ Can provide stronger evidence for a conclusion through convergence and corroboration of findings. ▪ Can add insights and understanding that might be missed when only a single method is used. ▪ Can be used to increase the generalisability of the results. ▪ Qualitative and quantitative research used together produce more complete knowledge necessary to inform theory and practice.	▪ Can be difficult for a single researcher to carry out both qualitative and quantitative research, especially if two or more approaches are expected to be used concurrently; it may require a research team. ▪ Researcher has to learn about multiple methods and approaches and understand how to mix them appropriately. ▪ Methodological purists contend that one should always work within either a qualitative or a quantitative paradigm. ▪ More expensive. ▪ More time consuming. ▪ Some of the details of mixed research remain to be worked out fully by research methodologists (e.g., problems of paradigm mixing, how to qualitatively analyse quantitative data, how to interpret conflicting results).

Appendix 8.1:

An Interview with IT Manager of a Multi-National Israeli-based Organisation (June 2007)

The interviewee was an IT manager of a multi-national Israeli-based organisation, which is a worldwide leader in the field of watering in agriculture.

Q: Please describe briefly the organisation in which you work (Range of activities, organisation's size, and number of employees):

A: The organisation is an Agri-Business pioneer and global leader and delivers innovative solutions that increase crop yields and preserve water resources. It is active today in over 110 countries on 5 continents, employing over 2200 employees, and has more than 30 subsidiaries and 13 manufacturing facilities in 11 countries.

Q: What is your practical experience in developing and implementing ERP projects?

A: Since 2000 the organisation has absorbed an ERP system in what they consider as one of the most crucial processes that has taken place in the organisation. The ERP project actually served as the platform to integrate three independent companies into one global concern entity, and in this process they had to generate the main central IT system from scratch. Thus, failure to develop and implement the ERP project successfully could have had disastrous results.

From this stage on, each new organisation that was purchased by them was integrated in the same standard way. Over this base, other new cross-organisational software packages (CRM, BW, BI) have been absorbed in order to serve as new layers of the IT system. This gives the organisation intelligent tools to use both in the day-to-day information streaming and in strategic decision making.

Q: What are your organisation's future plans in implementing ERP systems?

A: "Our present direction is to move to more global and more sophisticated extra-organisational projects. At present we have eight large companies within the central implementation that includes 75%, so we have transferred a little of the weight from the ERP to the whole subject of cross-organisational systems. When I look at what we are going to do in the future, it will be more sophisticated systems, more focus on the issue of global planning, more global demand planning. This, in turn, leads to added value to the organisation as a global one and shapes its global nature, including issues such as the Data Warehouse (BW), Business Intelligence (BI) modules of SAP and others.

In fact, we are constructing a BI system over it, in a process which has at present reached the final stages of choosing the system. Giving a BI system to senior management level will help them to derive the significant information from of the huge amount of data that we are collecting from all subsidiaries companies. This data would not interest senior management level if it is too lengthy and not graphically presented and applicable.

Therefore there is a need to implement a BI package with proven qualities of applicability as a layer based on the other cross-organisational systems (ERP, CRM) that we have.

Q: What is the estimated scale of the professional external manpower (IT Outsourcing) which participate in every project in man years?

A: From the aspect of the number of people, we put between three to four people on each module when we were applying all the modules simultaneously including HR (Human Resources) and CO (Control). So if I sum all the modules we had in this process – stock, purchasing, sales, production and planning, HR, CO and FI (finance), these are seven modules, meaning, a large set-up of twenty five people on these modules, plus management, which adds another four-five people. In total that means about thirty people participated in this project, including the IBM people. We added to each IBM implementer one or two of ours whom we called a "shadow" – Internal IT worker as an escort who joined the external implementer, so that we could actually absorb the implementation of the SAP from those experts in each of the modules. We recruited main users for full-time jobs - eighteen of them. The entire staff amounted to thirty, thirty-something people. When we went back to

normal dimensions, we were left with the core, which was the IT staff that we had recruited plus another 6-8, amounting to a size of 14-16 workers, which was the nucleus with which I had begun. I worked under the General Manager's and Management's guidance. They stood behind me in this project in a way that was both committed to the project and demanding for all participants. They did so as they understood the importance of succeeding in this project and the need for an effective IT system that could help them form a corporative agenda.

What happens now from a strategic point of view is that I'm growing, strategically making my core-group grow all the time with highly qualified manpower, and the number of staff doesn't depend on [the number of] projects but on routine maintenance, i.e. all the improvements and alterations that are required during regular work plus some sort of fixing of projects that I know will definitely be in our scope. For those projects I receive the green light and budget to start with. Apart from that, sometimes I also have a budget with no preliminary specific target as I don't know exactly what skills I will need in that project. So I keep only 43 workers and maintain a long enough rope to allow us to be flexible … We grow according to the growth in our applications abilities, in the geographic considerations of our users. This is the strategy that I work with in or5der to have a strong base of my professional people and I enlarge this staff by outsourcing according to the needs.

Q: What motivated you to use Outsourcing in the project implementation?

A: First reason is that when I have to bring in an external man with skills that we don't have internally. Secondly, outsourcing allows me flexibility in performing the projects. This helps me to solve bottle necks and to enable the organisation to develop without being dependent on the internal IT resources. And thirdly, as a consequence of the second reason, I don't want to increase my internal manpower, in places where I am not sure that I will need them again in the future.

The traditional reason for outsourcing is reduction in costs, when talking about ERP projects the situation is exactly the opposite –outsourcing increases costs – and that is one of the reasons that the organisation needs to try to reduce outsourcing when it can.

In meetings between information systems managers – I can tell you that in this area we continuously look at costs. And because of the exclusivity of this bubble, of the

market, of SAP applications with all their various functions, the wages are very high, the differences in costs, between maintaining an internal person and bringing him in from outside, are very large. As I maintained 32 external people last year, you can make the calculation - 32 people, multiplied by the difference between what I paid the external organisation and the salary that I would pay if those people were internal - the difference is very large. It's hundreds of thousands of dollars per year. And that's exactly the difference between doing another five to ten projects for the organisation or not doing them. It's my discretion, insofar as I can maintain more internal people, if I know that I won't have to fire anyone, and if I know that I will need them for projects or for regular maintenance work.

Actually I face two kinds of problems: First, if I employ a lot of people in my organisation in jobs which are very uninteresting or unchallenging, it is preferable to employ them internally and for a long time. But if they work for a short term only, then this has almost all the disadvantages, and then it is much more preferable to bring in outsourcing.

Because of the need to keep people with the necessary organisational knowledge, having an external work force for the long run seems to be problematic. Perhaps it is not so accepted in the market, and not everyone can succeed with this, but I myself hold such people for eight and nine years without any problems. Other people work with an exactly opposite strategy and hold very few people for maintenance, 15 men, and most of the projects that they do employ outsourcing staff from an external vendor. And projects can take a year, two years, and even more in time and scale.

I prefer the opposite, because of a very obvious reason, and perhaps it's because of the structure of our organisation - I have to keep external experts on an individual base for a long time and one of the reasons is our global dispersal. That means, here in Israel I manage the whole business, including our companies all over the world with each different culture. And I need people who will sit here and know exactly how the government projects work in India, what the tax laws are there, and how the processes run. So I have international 'gate keepers' who are actually responsible for each module, and they know the actions for that module throughout the world. If I lose one such gate keeper then suddenly I can find myself without a critical base of knowledge and this may simply 'freeze' the organisation. Isn't it a waste of time and assets? I actually halt the organisation. Then I have to look again for the most talented outsourcing expert in the market, and teach them the knowledge. I would say

that it takes a year and a half, for a person to learn now about 8 eight companies, and all their cultures, all their peculiarities, how dealers from Australia work and what the taxation laws are for large projects in Mexico or India. We have that knowledge; we have all that knowledge here at home, so we simply maintain an army for that. So actually that's the reason for this policy, and this is really a factor that you need at least to notice, as a weighty factor in any organisation that wants to inspect itself. But this may distinguish us from other companies because they mostly have one main site, sometimes huge and very complex sites with many users, but only one site. Here, we are spread out globally and so the processing of the information becomes expensive, and we cannot afford losing vital people that have already gained the right experience to handle those tasks.

Q: Do you think that using the outsourcing support in your organisation was successful?

A: Yes, definitely yes. I have people who are with me for years, whom I have taken on as a result of lack of internal expertise or manpower. A contract that began on this basis or to fill in a gap in working staff, I usually turn it afterwards into some sort of long term retainer contract, where I try of course to lower the costs in return for my commitment to long term work. It is usually based on two things, one, the man's expertise is in a niche subject and I don't want to replace him because he is already an expert in this field. For example, in projects that I perform abroad, I keep two men … these two men have become specialists … In this case they are also amenable to travelling and working abroad ,which is not suitable for everyone. It is known that such roles cause great difficulty for global companies, and they need to look for unconventional people who would fit that profile. It's often a question of the suitability of the person to that niche position, it's not because I'm very satisfied with his price, and usually I pay expensive fees for this job.

The optimal method is to turn an external expert from outsourcing into an internal employee. Again, I try to follow this strategy, it doesn't always work and it's not always acceptable, and by the way it goes more easily with small outsourcing vendors, less with the large ones. The way in which I cope with these situations and prepare the ground for such transfer is by adding what is called a transfer addendum when I take someone for some sort of long term contract. It is an accepted practice,

very unpopular with the [outsourcing] companies and I usually have to "bend" their arms. There are those who agree, there are those who don't. By the way I'm known in the market as a person who is unwilling to make a long term contrast without such a transfer clause. And this means that if and when after a certain period of time, the person himself wants it, and we want it, we have created a win-win situation for us and the worker. That means, the organisation itself, employs the person here for the long term contract; so that we cut out our coupon. The person has usually already trained himself while working in our organisation, and that is far more profitable than taking someone from the market because he already has knowledge regarding our organisation, its activities and culture. So, we actually say, at this stage, let's assume, that in a year from today, or in a year and half from today, the time doesn't matter; the employee will transfer to us. However, it depends on his will, and then usually, what I do is to draw up a memorandum with the guy. Its not, let's say a "legal" contract, no sort of signature on any papers. A memorandum that is written here and written for him, which proposes, that if he does decide to transfer, I shall take care of him like this and he will do like that..

Usually, I would say, we don't even reduce the conditions. He can assume that in the consulting organisation he would perhaps get a little less; 5%-15% lower than the market**.**

Q: Can you please specify the factors that, in your opinion, contributed to successful outsourcing?

A: What should be very important is the accumulated experience of management when working with outsourcing experts and vendors plus the professional experience and knowledge [of outsourcers] in the application of the ERP new systems. The outsourcing of today is not the outsourcing that once existed. There is definitely a difference here between what is called the market situation … there are so many differences. IBM's outsourcing professionals were in the beginning with very little experience, and the contract that was signed between us and IBM was the best possible which they knew how to supply, and the best that we knew how to demand, and of course there were many holes in it. Considering this fact, at the end of the project there were many arguments. What had been and what had not been… and even in the professional sense, at that time … the management of the project was reasonable, correct management that set milestones, with insurance percentages,

supplementations etc., everything that was needed by management. Today we already know after the first month of discussion what should be done and what experience the implementing vendor should have, and not as was before only after eight months of working together.

What is missing today, and is very important is double-checking. Today they do acknowledge that the blue print is very important, they discuss the blue print, but they do not double-check it. They do not check whether we have really asked the correct questions. They need to come and try to challenge the existing perception, and to say 'wait a minute, wait a minute, why this, or why in that exact way … perhaps it should be otherwise' and to be convinced 100% that what you are going to do in that stage is the correct thing. We do ask those questions, but I think that in the outsourcing companies they don't, and run straight on in to the implementation.

Q: Please specify the factors that, in your opinion, contributed to the success or failure in implementing and ERP project.

A: The ERP is a largely an integration process and that influences the delivery of successful project. Managing the integration of an ERP project in the right way has an extreme influence. This is like having a collection of stars, as in a football team, and if those stars cannot communicate with one another, they cannot deliver as a group. They should be in good relationship, and then perform according to a solid methodology and under a good integrating management. A manager simply has to ask the right questions in the right place, and put his capable people in the right direction.

Management of risks is enormously important. We discuss this with each person in the organisation. I just now finished a phone call … doesn't know enough, not strong enough, not sufficiently up-to-date, it could be very risky for the organisation, and then what would we do? … It's clear, it's the back bone, and it's the system of checking out the performance of the organisation. The subject of integration is critical, for the success of the ERP system ….

Q: What are the success and failure factors when using Outsourcing in ERP projects?

A: Very often in projects, both ours and those of others, the main factors for success were not defined. That means it was not clear what we actually wanted. We know that the mission is to deliver a working system of ERP, but what is important? Is it important that it will respond faster? Is it important that it will operate smoothly? Is it important that the financial system should know how to function immediately in the first month? Is it important that the stock reports will be accurate? Are the calculations of benefits important? What matters?

Q: You mean priorities?

A: Yes, to provide priorities and give them weights, and accordingly to manage the follow-up. These matters usually don't happen explicitly, but we simply stream into a project and run with it.

The second thing is the decision-making mechanism. Let's call it conscious decisions. That often means the ability to bring a subject to the steering committee. It is actually a very substantial part of the success, [the ability] to make intelligent decisions. And this means the ability, to really succeed in presenting very complex material that usually also includes [foreseeing] future influences on this set-up, how this set-up is constructed etc., and what its maintenance will require in future years, and what is expected to be the exit at that time … and all sorts of matters and business influences that the decision implies.

Knowing how to present a very complex situation in a very simple manner is one of the skills required from whoever manages this project to ease the process of the decision making. You cannot bring a very complex picture to the steering committee. You begin to talk about very complicated matters and then you lose the people, and in the end they make decisions without understanding. And so, actually, making intelligent decisions is a main factor, of course through the steering committee, or through a senior management forum that deals with the project. And the ability to make intelligent decisions is largely based on the ability to identify the problem, to understand the significance of the problem in the simplest way at that committee. … and today we hopefully know how to do it far better. Back then, we fell down in not a few discussions, when there was actually no-one there who

understood anything that was mentioned and several senior managers arrived, including the Managing-Director and the Deputy Managing-Director who did not understand anything of the discussion, and actually there were a lot of unproductive discussions, with a lot of management commitment. I mean, that I had to indicate the need for management commitment … its always present in all my presentations, it is not enough and decisions should be based on the right information so that they will be appropriate.

Other factors for success – there is the whole issue of managerial change. It's the whole issue that ERP project is not just a project, but a change in business. If it ends with a software project, that means they take software A, transfer it to software B. But it is much more than this, since they also need to change their decision-making process, and it involves a change in workflows and in the whole organisation. Sometimes it involves creating new organisational functions. Here, we established a set-up of MRP supervisors, and a set-up of supervisors, controllers of the organisation, in each of the companies that we have acquired; changing the organisational structure of the organisation. And without emphasising this issue from the beginning with all the managers, then usually afterwards, you get the refusals, and encounter difficulties.

Q: **Is Outsourcing a must? Can an organisation start a new ERP project without being assisted by outsourcing? Do you know about any organisation that had done this?**

A: I wouldn't recommend anyone to do that (i.e. not to use outsourcing).

I would even consider another question on this matter … whether just one outsourcing vendor is sufficient. I mean, what I have hinted before… double check with the professional bodies. Often professional A brings his knowledge, his understanding, the three applications that he did before, and you need to bring in different viewpoints on the same issue - to bring an additional expert or second opinion for each decision is correct, and I wouldn't recommend otherwise.

It is simple for an organisation, even if it means now to recruit three, four, five-six implementers, and to say "these implementers will perform the project", there's usually a lot of thinking and interaction here, and you need to think that one particular implementer may not necessarily know, and he needs broader support, you need the discussions, the ability to look in other places, to survey things and search.

Therefore it is advisable that the vendor's organisation should have a large enough background, demonstrating broad knowledge and experience. And the second reason is the vendor's methodology. They may recruit stars and bring them in, but necessarily, an organisation that has this profession comes with a clear methodology, with tools, with formats, with defined patterns, with Excel and Word tables for decision-making … an organisation with past experience is certainly needed in a first project, or in the initial steps of the projects. I can say that because I have this experience today, we already have the tools and methodology of international SAP and of IBM, we implement them all. And we also include workshops about managing change that we deliver in our subsidiaries companies, but this is actually wisdom in retrospect.

Q: Has the weight of the Outsourcing changed during the project's lifetime? If so, what you recommend to do in order to maximise the cost-benefit ratio in this process?

A: In my opinion, yes, the weight has changed from the phase in which the solution is defined to the phase when the solution is actually being implemented where you sometimes need external expertise and then afterwards when you can rely on your internal people to check the integration. After you take off, and in the training phase, outsourcing is less important and less critical, and it's more a matter of whether or not you have the necessary people. There is also a matter of short term enlargement of your staff with temporary people. That means you usually don't hire people for training for a two months period, instead, you bring in external trainers. But in this case the need is for manpower and less because of a shortage of in-house experience and a lack of internal tools and methodologies.

Appendix 8.2: Open-Ended Questionnaire (with sample answers)

Dear IT managers,

I am conducting a study on a PhD level about IT outsourcing, for which I am gathering information regarding the success factors for IT outsourcing within ERP projects in Israel.

This questionnaire is anonymous. I assure you that I will maintain the confidentiality of your answers, and the information will be used only for research purposes.

This is an open-ended questionnaire, which deals with the success factors of IT outsourcing. Every question can be answered in several ways, so you are asked to please provide the views that best reflect your true opinion.

I appreciate your participation in this questionnaire, thus contributing to a better understanding of the ways in which IT outsourcing is implemented in Israel.

Thank you for your contribution,

Yehoshua Itzhaik

1. Please describe briefly the organisation where you work:

Range of activities: _____,

Organisation size: _____,

Number of employees: _____,

Scope of the IT department within the organisation: _____

The XXXX Organisation (fictitious name) is an international organisation, focusing on project implementation (products and improvements - engineering to order) for the military industry. It is a conglomerate of several companies, employing more than 10,000 workers. It's central IT unit provides services for some of its companies, but not to all of them, relating to a certain extent of service and warrantee agreements, and has been modified to meet the organisation's specific requirements and needs. The central IT unit includes about 100 workers of which 30% are information system professionals.

2. What is your practical experience in developing and implementing ERP projects? (Please specify your level of specialisation and years of experience.)

I have participated in implementing a number of generations of ERP systems throughout the years, both as a partner and as a project leader. The most recent version that my team and I implemented, a BaaN system, has been implemented in more than six companies. This has given me over 20 years' experience in the ERP area, where I have worked as a project manager over the last few years. All this experience has provided me with a good level of proficiency.

3. What is your organisation's accumulated experience in implementing ERP systems and how many years of this experience were accumulated before using external outsourcing?
(Number of years; number of projects; an estimated range of accumulated workforce years on the projects)
Throughout the years, my ERP team, in various formats, has gained wide experience while developing many projects. In this respect, the total invested time was far more than 100 professional maintenance/development years.

4. What is the estimated magnitude of the professional external workforce (IT Outsourcing) which participate in every project in man years?
I and my ERP team have been working together with sub-contractors for the last 8 years and this external workforce has been about 30% of the staff.

5. What has motivated you to use Outsourcing in the project implementation?

Our motivation was to use reliable professionals in order to be supported by their technical and applicative experience and knowledge. This has given us the confidence to safely launch complex and critical mission projects, maintaining quality and preventing failures due to first time implementation. We also try to transfer the new knowledge by training our internal people while working together in an integrated team of the internal and external workforces.

6. Do you think that implementing an ERP project in the organisation was successful? Why? (Please specify the factors that, in your opinion, contributed to its success or to its failure)

It's all in the eyes of the beholder. Practically, we met our deadline and installed a working system that did the work. All this depended heavily on the experience that the management and the organisation has as a whole. For an ERP project within outsourcing in our organisation, this was a critical factor at least in the first cross-organisational projects. That's why our first projects were not as successful as the later ones. We learned that we need to define the goals and the mutual expectations more clearly, and build the right mechanism of interaction with the outsourcing vendors and workers; additionally, it is important to integrate the teams in a synergetic way, and to be involved in the process to ensure everybody's commitment to reach the goals.

It was also a question of expectations – if we had thought in the past that outsourcing would lower our costs, reality demonstrated the opposite, but we do not consider this as a failure because the other priorities were much more significant for us. We somewhat failed to achieve user satisfaction when the first projects ran behind schedule and we did not give the users enough training and support. This taught us to be aware of planning and implementing the project successfully with outsourcing support throughout the entire project's life-cycle.

7. Do you think that using the outsourcing option in the project in your organisation was successful? Why? (Please specify the factors that, in your opinion, contributed to its success),
Do you think that using the outsourcing option in the project in your organisation failed? Why? (Please specify the factors that, in your opinion, contributed to its failure),

The usage of outsourcing was definitely successful. This was due to the ability to build a synergetic team, in which all the group members performed tasks in accordance with their specific qualifications and strength, and not necessarily

according to their formal position and the fact that they are members of the organisation or belong to the external vendor.

8. Do you think that there is a difference in the use of IT outsourcing within ERP projects (and cross-organisation projects in general), compared to outsourcing in the traditional software projects.
If yes, please explain what the difference is

Cross-organisation projects require a deep level of understanding of the ERP package and of the organisational processes in the context of their surrounding environments. Therefore, they require past-experience working on similar projects. That's why outsourcing plays such an essential role.
As the ERP package must be customised to the specific organisation environment we need both internal and external professionals to provide an extended period of training, which is why I do my utmost to retain people as long as possible in order to achieve maximum results.

In standard and more traditional software projects we usually look for technical capabilities, and if these requirements are met, the results are usually met too.

9. In your opinion, what are the success and failure factors when using outsourcing in ERP projects?
Besides choosing highly qualified and experienced external professionals, the organisation has to make the outsourcers feel committed to its targets and well-being. Otherwise indifference or even dual loyalty can present a real problem, translating into bad results.

10. In your opinion, can the organisation start a new ERP project without being assisted by outsourcing? Do you know about any organisation that had done this?
Actually, there is no real alternative for implementing ERP system without external assistance (DBA, consultants, and so on). Needless to say, this comes at the expense of added time and expenses until the system is properly assimilated, in order to acquire the applicative and technical knowledge.

11. Do you think that using IT outsourcing in ERP projects is a must? What are, in your opinion, the main reasons for this?

The need for past-experience is a critical factor in this complex project. It is much more important when the organisation enters its first ERP project, but also later when implementing new modules, this kind of help is most significant.

12. In your opinion, did the need to reduce the risk of failure in the project by using external expertise, motivate your choice to use outsourcing?

We are speaking about critical and cross-organisational systems that can affect the whole organisation. A considerable effort is needed to make the development process lead to successful results, and [only] an experienced external vendor can lower the chances of failure.

13. In your opinion, did the need for exposure to new technologies and to adopt innovative information systems motivate the decision to use the IT outsourcing? And to what extent?

In the context of ERP systems, new technologies and new modules are being developed by the package developers – and to catch up with each new technique, we must invest in courses and continuous training. The best policy is to learn from external experts, who were exposed to such technologies and experienced them in a real life environment in other companies.

14. If you didn't have the option to use outsourcing, can you think of your internal workforce as a substitute (i.e. by training internal workforce or recruitment of an expert on a salary basis)?

As I said in my previous answers – We can definitely (and actually do) use the internal workforce (current staff or newly recruited) as a full/partial substitute for an outsourcer. The decision depends heavily on the status of the project and the period of time in the project's life-cycle. This decision, however, must be taken on the basis of economic and business considerations, as well as taking into consideration the

organisation’s own capability and knowledge, compared to what can be acquired through outsourcing. At the end of day when the whole complexity of the situation is taken into account, there remains a need to build a “winning team” to run the process until its successful assimilation while supporting the organisation's requirements and targets for the system.

15. Do you think that the outsourcing role changes during the project's lifetime? If so, what would you recommend to do in order to maximise the cost-benefit in this process?

There must be changes in the team's composition during the project life-cycle and after the completion of the development phase, from designers at the beginning of the process to programmers and code-writers and testers later on, and assimilators at the end of the process. As was said in the previous section, a major consideration is having the right people on the job, in terms of capabilities regarding knowledge of the system, knowledge of the system’s environment, having interpersonal skills, having technical proficiency, etc., while keeping the implementation and assimilation costs down to a minimum. In order to achieve this, there is a need to maintain a skilled workforce, irrespective of the internal employees' salaries.

Appendix 8.3: Close-Ended Questionnaire

Dear IT managers,

I am conducting a PhD level study concerning IT outsourcing, for which I am gathering information regarding the success factors of IT outsourcing within ERP projects in Israel.

This questionnaire is anonymous. I assure you that your answers will remain confidential, and will be used only for research purposes. This is a close-ended questionnaire, which deals with the success factors of IT outsourcing. You are asked to mark the extent of importance of each item according to a scale. You are asked to please mark the grade that best reflects your true opinion. I appreciate your participation in this questionnaire, thus contributing to a better understanding of the ways in which IT outsourcing is implemented in Israel.

Thank you for your contribution,

Yehoshua Itzhaik

Part A: The Reasons to enlist IT Outsourcing Assistance for an ERP Project

The following table presents a list of possible reasons that would motive an organisation to choose the assistance of outsourcing in an ERP project. Please mark with an X the **extent of importance** that you would attribute to each of these reasons.

The Reasons to enlist Assistance from IT Outsourcing in an ERP Project	**The Extent of Importance of the Reason**				
	Very High	**High**	**Medium**	**Low**	**Very Low**
To enable the organisation to focus on core business issues					
To access best-practice capabilities to develop strategic systems					
So that the organisation can be exposed to new strategies, disciplines or services					
Swifter response to achieve organisational and strategic objectives					
To reduce ERP project development costs					
To reduce development time by outsider expert support					
Flexible budgeting of the project					
Share or reduce risks by sharing with external entity (fines for non-compliance with goals)					
Rationalise expenses: Transforming a capital investment (in-house staff wages) into operational expenses for external staff					
Avoid increase in in-house work force					
To employ experienced professional manpower to manage the ERP project					
To get a commitment to timetable, products and a pre-defined and closed budget.					
Improve efficiency and performances and flexibility in the development process					
Accumulate knowledge and experience in the development process of a new system for the organisation					
Introduce different external viewpoints and disciplines into the organisation					
Ability to impose penalties for non-performance / non-compliance with goals					
To enable optimal utilisation of in-house staff					
To access and implement new technology					
Acquire expertise not available in-house					
Increased probability to construct stable information system					
Correct implementation with minimum customisation and deviations from standard					
To get to know the common defects and previous experience of how to solve them					
To cope with deficiencies of in-house staff					
To maintain stable levels of internal teams					
To reduce number of direct employees					
Add more personnel to fill a need for short-term, part-time or temporary efforts					

Overcoming the difficulty in recruiting and maintaining IT professionals					
Be more market competitive					
To maintaining and upgrade organisational knowledge assets					
Improve customer service (both intra- and extra-organisation)					
Facilitate and simplify performance of changes in the organisation					

Part B: Factors for the Success of an ERP Project performed with Assistance of IT Outsourcing

The following table provides a detailed list of the factors for success of an ERP project performed with assistance of IT Outsourcing. Please indicate with an X how important each factor is and to what extent is this factor expressed in implementation during the management of the project in your organisation.

Factors for success of an ERP project conducted with assistance from Outsourcing	**Extent of the Factor's Importance**					**Extent to which the Factor is Expressed in the Project in your Organisation**				
	Very High	**High**	**Medium**	**Low**	**Very Low**	**Very High**	**High**	**Medium**	**Low**	**Very Low**
Commitment, involvement and endorsement by the organisation's management for the project, and for integration of outsourcing										
Definition of goals and methodical planning of the project.										
Election of contractor with professional experience and strong managerial abilities and experience in the introduction of change in an organisation										

Factors for success of an ERP project conducted with assistance from Outsourcing	Extent of the Factor's Importance					Extent to which the Factor is Expressed in the Project in your Organisation				
Examination of the contractor's ability to comply with professional and managerial commitments.										
Ensuring a high level of consultants in main positions (management, architecture, and implementation).										
Preference for a contractor with prior knowledge of the customer's systems										
Agreement with the contractor concerning contents at the specification stage										
Definition of detailed work plan for the contractor										
Pre-determination of logical timetable for the project										
Lucid mutual contract clearly defining contractor-client obligations										
Contractor's undertaking for stable staff during project										
Alterations of contents and work conditions coordinated with contractor										

Factors for success of an ERP project conducted with assistance from Outsourcing	Extent of the Factor's Importance					Extent to which the Factor is Expressed in the Project in your Organisation				
Creation of common contractor-client approach (WIN-WIN)										
Construction of mechanism for supervision and control of progress										
Tight cooperation between contractor and client										
Contractor undertakes to conduct training of replacements, guidance and instruction										
Close escorting of the organisation juniors by external consultants										
Contractor works according to systematic methodology of project management										
Construction of set-up with decision-making mechanisms										
Effective management of 'surprises' and unanticipated incidents										
Flexibility in handling of consultants and the external companies for better control and supervision										

Factors for success of an ERP project conducted with assistance from Outsourcing	Extent of the Factor's Importance					Extent to which the Factor is Expressed in the Project in your Organisation				
Adding external independent consultants to ERP project manager										
Contractor's stipulation to ensure fair and proper work conditions for his employees										
Correct calculation of hidden costs in advance										
Providing the contractor's employees with an empowered sense of identification and commitment to the success of the project										
Assimilation of the contractor within the organisation's culture										
Overcoming resistance within the organisation before the project begins										
Professional treatment of the technical infrastructure and materials										
Treatment of information security within the organisation										
Learning from the contractor's sophisticated management and technology tools										

Factors for success of an ERP project conducted with assistance from Outsourcing	Extent of the Factor's Importance					Extent to which the Factor is Expressed in the Project in your Organisation				
Constructing a combined balanced team from the external and internal manpower										
Reducing the extent of dependence on the external contractor										
Taking care to maintain the knowledge within the organisation										

To what extent (%) did the outsourcing in the ERP project realise expectations? in the strategic field _____in the organisational field _____in the economic field _____ and in the technological field ___?

Did the outsourcing really reduce development costs in the ERP project? Yes / No
and in non- ERP projects? Yes / No

Is it possible to succeed in an ERP project without the assistance of outsourcing?
Yes / No
and why is this so? _____

Grade the level of the employment of outsourcing (High = 5, Low = 1)
at the planning stage _____
at the implementation stage _____
at the customisation and instalment stage _____
at the assimilation stage _____

Which system was assimilated: SAP /ORACLE/ Other
What was the scope of the project that was performed by outsourcing?
Modules ___ Users _____ and % of outsourcing used in it ____
General Questions:
In which area does the organisation operate ? _____
What is your function in the organisation _____
What was your function in the project _____
How many years of experience do you have in your function ____

Thank you for your cooperation

Appendix 9.1 - Themes emerging from open-ended questionnaire

CATEGORY 1: TECHNOLOGY

Theme 1: Gap in knowledge and experience

Initial codes:

*Experts cannot be found internally or trained up in-house

*Need well experienced analysts

*Need access to important information technologies

*Need access to specific IT skills and services

*Gain knowledge of common defects and their proven solutions.

Theme 2: Adequate ERP implementation strategy

Initial codes:

*Avoid customisation

* Adequate ERP version

* Adequate software configuration

* Avoidance of technological obsolescence

* Use proven experience in business process reengineering

* Standardising IT environment (hardware, software processes)

* Set up a well-functioning IT environment.

Theme 3: ERP is package-based generic enterprise software

Initial codes:

* Implementation is mainly a customising and integration process
* Customise or change business processes
* ERP has Cross Industry Applications Components (i.e. knowledge may be reusable)
* External experts can successfully adopt their experience from other installations
* Need experience in conversion, interface, modification and integration of new versions and experience in complementary products
* ERP packages are being improved and changed continuously
* Need support on a steady basis
* Large-sized software* Need experts' specialisation in sub-modules, Financial (FI), Logistic (SD) etc.

Theme 4: Tools and packages

Initial codes:

*Use vendors' development tools
* Need for common and standard ERP technology platform
* Increase standardisation in technologies used
* Need to integrate the ERP system with other systems
* Need to link all group's sub-companies into same network
* Holistic renewal of organisation's information systems.

Theme 5: Problems with maintenance of the old systems

Initial codes:

* Old system used obsolete technologies
* Old system did not operate in the required way
* Old system not amenable to further development.

Theme 6: Replacing aging IT architecture or technology

Initial codes:

*Need to adopt a modern ERP system

*Abandonment of old mainframe computer

*Need to meet increased requirements

* Consideration of investing in replacement

Theme 7: Drawbacks of ERP Implementation

Initial codes:

* Implementation complexity

*Integration problems

*Customisation problems

CATEGORY 2: ECONOMIC

Theme 1: Increase control of IT expenses

Initial codes:

*Enhance economies of scale in technological resources

* Enhance economies of scale in human resources

* Technical economies of scale

*Optimise "cost" factors - implementation assistance cost, cost of system integration, reengineering cost,

* Get commitment to timetable and closed budget

* Impose penalties for non-performance/non-compliance with goals

* Enable optimal utilisation of in-house staff

* Flexible budgeting of the project.

Theme 2: Economic considerations

Initial codes:
* Reduce ERP project development overall risks
* Reduce time – expert outsider can complete the job faster than in-house team
* ERP systems require continuous investments in new modules and upgrades
* Increase access to skilled personnel
* Access unavailable services.

Theme 3: Economic benefits

Initial codes:
*Correct implementation with minimum customisation and deviations from standard
* Shift from capital to operating expense
* Avoid increase in in-house work force
* Improve efficiency and performances with a flexible development process
* Better match resource supply
* Better use of in-house personnel
* Improve the management of technology and human resources

Theme 4: Cost saving is questionable

Initial codes:
*Expert's salary is among the highest in the industry

Theme 5: Economic Drawbacks of ERP

Initial codes:
* ERP projects are often long and intense
* Over budget and late projects.

CATEGORY 3: MANAGERIAL AND ORGANISATIONAL

Theme 1: Pre-conditions to success

Initial codes:

* Definition of goals and methodical planning of the project
* Commitment
* involvement and endorsement by the organisation's management
* Top management support
* Successful integration of outsourcing factors

Theme 2: Managerial considerations

Initial codes:

* Enhanced management control
* Monitoring and evaluation of performance
* Management of expectations
* Empowered decision makers
* Strong communication inwards and outwards
* Formalised project plan/schedule
* Comprehensive business re-engineering

Theme 3: Operational Issues

Initial codes:

* Balanced project team
* Discipline and standardisation
* Reduction of the number of direct employees

Theme 4: Working Teams

Initial codes:

* ERP necessitates appearance of new professions (SuperUser etc.)
* Adequate project
* Champion role
* Maintain more stable in-house staffing levels team composition
* User involvement and participation
* Dedicated staff and consultants
* Appropriate usage of consultants
* Adequate training programme
* Flexible IT personnel assignments.

Theme 5: Organisational behaviour

Initial codes:

* Organisational change and resistance to change
*Overcoming the difficulty in recruiting and maintaining IT professionals.

CATEGORY 4: RECIPROCAL RELATIONS WITH OUTSOURCING VENDORS

Theme 1: Trust and cooperation

Initial codes:

* Trust between partners
* Tight cooperation between vendor and client
* Constructing a combined balanced team
* Vendor's employees empowered by a sense of identification and commitment to the success of the project
* Assimilation of the vendor within the organisation's culture
* Overcoming IT staff opposition and resistance within the organisation
* Security within the organisation
* Reducing the extent of dependence on the external vendor

Theme 2: Contract and Legal issues

Initial codes:

* Vendor-client approach (WIN-WIN)
* Definition of detailed work plan for the vendor
* Pre-determination of logical timetable for project performance
* Lucid contract clearly defining vendor-client obligations
* Vendor's undertaking for stable staff during project
* Agreement with the vendor concerning contents at the specification stage
* Alterations of contents and work conditions coordinated with vendor
* Vendor's stipulation to ensure fair and proper work conditions for his employees
* Hidden costs in the contract.

Theme 3: Operational

Initial codes:

* Proper planning and benchmarking
* Construction of mechanism for supervision and control of progress
* Vendor's technical assistance
* Vendor works according to systematic methodology of project management
* Effective management of 'surprises' and unanticipated incidents
* Correct calculation of hidden costs in advance.

Theme 4: Vendor's Selection

Initial codes:

* Qualification of the provider's staff
* Vendor with strong managerial and professional experience and abilities
* Evaluation of the vendor's ability to comply with professional and managerial commitments * Preference for a vendor with prior knowledge of the customer's systems
* Ensuring a high level of consultants in high positions (management, architecture, and implementation).

Theme 5: Maintaining experts' knowledge

Initial codes:

* Taking care to maintain the knowledge within the organisation
* Close escorting of external consultants by the organisation's juniors
* Vendor undertakes to conduct training, guidance and instruction of replacements
* Learning from the vendor's sophisticated management and technological tools.

CATEGORY 5: STRATEGIC

Theme 1: Maintaining organisation's core-competence

Initial codes :

* Refocus on core business and outsource routine IT activities
* Focus only on strategic uses of IT
* Swifter response to achieve organisational and strategic objectives
* Capacity to refocus on core business
* Improved flexibility for the business
* Facilitate and simplify performance of changes in the organisation
* Better match resource supply
* Enhance management control of the Enterprise
* Improve IT capability to support business operations' needs.

Theme 2: Maintaining strategic assets

Initial codes:

* Maintain and update organisational knowledge assets
* Be market competitive
* Improve customer service (intra- and extra-organisation)
* Innovative Capacity with IT systems opened to continuing innovation
* Outsourcing exposes organisation to new strategies, disciplines or services.

Theme 3: Failure is deadly risky for the organisation

Initial codes:

* ERP is central complex and critical cross-organisational system
* Very costly to implement
* Organisation's largest-ever IT investment
* Success is enabler for business strategic competence.

Theme 4: IT Outsourcing is the de-facto procedure when implementing ERP

Initial codes:

* Requirements for rapid deployment of mission-critical systems**:**
*Need best experts with past wide hands-on experience in other enterprises
* Access best-practice external capabilities to develop strategic systems
* Enhance IT competence and expertise through contracting with outsourcer
*Increased probability to construct stable information system
* Gain robust and stabilised software infrastructure and applications.

Theme 5: Strategic risks using outsourcing

Initial codes:

*The risk of excessive dependence on the provider

*The risk of Loss of critical skills and competences

*Need to maintain the knowledge within the organisation.

Appendix 9.2 Table 1: Summary of the results of the open-ended questionnaire

Theme	Strategic					Technology							Economic					Management & Organisation					Organisation-Vendor Interaction				
Response	S1	S2	S3	S4	S5	T1	T2	T3	T4	T5	T6	T7	E1	E2	E3	E4	E5	M1	M2	M3	M4	M5	I1	I2	I3	I4	I5
Av - 16	2	1	1	3		4		1	1		1	3	2	2	1		2	1	2	3	1	1	1	3	1	1	1
Da - 8	3		2	3		2	1	1	3			2	2	2	1	1	1	3	1	3	1		2	1	1	2	3
Pi- 8	3	1	1	1		3			2		1	1	3	1	1	1		2	3	3	3	1	1	1		1	1
Ca - 6	3	1	2	3	1	2	2	2		1		3	3	1	3		1	1	2	3	2		2	2	1		3
Go - 7	2		2	2	1	3	1	1	3		1	3		2	2	1	1	1	2	1	1		1	2	2	1	1
Sh - 5	2			1	1	2		1	1			2	1		3		1	2	2	2	2	1	1	1	1		1
Gl - 5	1	1		2	1	3	1		2			1	1	2	2			1	1	2	1			3	2	1	1
Kh -5	2	1		3		3		1	1	1		2		1	3	1	1	2	2	3	3	1	1	1	1	1	2
Il - 4	1	1	3	3	1	3	1	1	2			2	2	2	3		1	1	3	1		1		1	1	1	1
Mo -4	1		1	3		2		1	3		1	2	1	1	2	1	1	3	3	2		1	2	2	1	1	1
Kf -4	1	2	1	1	1	4			1	1	1	1	3	3	1		1	1	2	3	1		1	1	2		1
Tl - 3	1	1	2	1	1	2	1		3			2	3	2	3		1	2	2	2	2	1		2	1	1	1
Az - 2	2	1	2	1	1	3	1	1	1		1	2	3	3	2	1	1		1	2		1	2		3	1	
Ny -2	3		2	1	1	3		1	2			1	2	3	2		1	2	1	3	3	1	1	3		1	1
Vp - 1	3	1	1	1		2		1	1			1	1	2	3	1	1	1	1	1	2	1	1	2	1	1	1
Total	30	11	20	29	9	41	8	12	26	3	6	28	27	27	32	7	14	23	28	34	22	10	16	25	18	13	19
Total-mean	2.00	0.73	1.33	1.93	0.60	2.73	0.53	0.80	1.73	0.20	0.40	1.87	1.80	1.80	2.13	0.47	0.93	1.53	1.87	2.27	1.47	0.67	1.07	1.67	1.20	0.87	1.27
Result	4	21	14	5	23	1	24	20	10	27	26	6	8	9	3	25	18	12	7	2	13	22	17	11	16	19	15

KEY

S1 Keeping organisation's core competence	T1 Gap in knowledge and experience	E1 Increased control of IT expenses	M1 Pre-conditions for success	I1Trust and cooperation
S2 Adequate ERP implementation strategy	T2 Economic considerations	E2 Managerial considerations	M2 Contract & Legal issues	I2 Keeping strategic assets
S3 Failure is a deadly risk for organisation	T3 ERP is package-based generic	E3 Economic benefits	M3 Operational issues	I3 Operational Issues
S4 IT Outsourcing is the de facto procedure for ERP implementation	T4 Tools and packages	E4 Cost saving is questionable	M4 Working teams	I4 Selection of Vendor
S5 Strategic risks using outsourcing	T5 Problems involved in maintenance of old system	E5 Economic drawbacks in ERP implementation	M5 Organizational behaviour	I5 Retain experts' knowledge
	T6 Desire to replace aging IT architecture of technology of legacy system			
	T7 Drawbacks of ERP implementation			

Appendix 9.3:
Results of Content Analysis of Five Semi-Structured Interviews

ISSUE 1: MOTIVATION TO USE IT OUTSOURCING

No. of comments = 61 of total 163 (37.42%)

Theme	Sample Comments by Theme
(13 comments) ***ERP project necessitates Outsourcing:***	**"**I wouldn't recommend that anyone should avoid using outsourcing… I would consider whether just one outsourcing vendor is sufficient …. to bring in different viewpoints on the same issue - to bring an additional expert or second opinion for each decision is correct, and I wouldn't recommend otherwise" "…and the second reason is the Vendor's methodology**…** an organisation who has this profession, comes with a clear methodology, with tools, with formats, with defined patterns, with Excel and Word tables for decision-making …" "an organisation with past experience is certainly needed in a first project, or in the initial steps of the projects"
(33 comments) ***Gap in skills and experience***:	First reason to bring an external man is to gain skills that we don't have internally." "I have taken them because we lack the internal expertise or manpower."
(11comments) ***Flexibility***	Secondly, outsourcing allows me flexibility in performing the projects. This helps me to overcome bottlenecks and to enable the organisation to develop without being dependent on internal IT resources. And thirdly, following the second reason, I don't want to increase my internal manpower in places where I am not sure that I will need them again in the future. " "This is the strategy that I work with in order to establish a strong base of my professional people and to enlarge this staff by outsourcing according to the needs."
(4 comments) ***Quality***	**"**Our motivation was to use reliable professionals also in order to gain high quality production".

ISSUE 2: SUCCESS FACTORS

No. of comments = 56 of total 163 34.36%

12 comments) ***Management's commitment***	"I worked under the guidance of the General Manager and Management who backed me in this project in a way that was both committed to the project and demanding for all participants. Also they demonstrated **leadership** to motivate the employees to the change. They did so as they understood the importance of succeeding in this project and they have an effective IT system that could help them form a cooperative and administrative agenda".
Success factors for ERP in general: **(10 comments)** ***Managerial change***	ERP project is not just a project, but a change in business, without emphasising this issue from the beginning with all the managers, then usually afterwards; you get refusals, and encounter difficulties".
(8 comments) ***A good contract with vendor*:**	experienced management when working with outsourcing experts and vendors "– "The contract that was signed between us and IBM was the best possible which they knew how to supply, and the best that we knew how to demand, and of course there were many holes in it. Considering this fact, there were too many arguments at the end of the project".
(7 comments) ***Good reciprocal relations between the project's participants***	"Should maintain a good relationship, and then perform according to a solid methodology and under a good integrative management**."**
(6 comments) ***Control and collaboration*:**	**"**Management of risks is enormously important…, "The subject of integration is critical, for the success of the ERP system"
5 comments) ***Planning***	"To provide priorities and give them weights and to manage the follow-up accordingly".
(3 comments) ***Good decision-making mechanism*** **(3 comments)** ***Good Business Culture***	"Also a good **business culture** that highlights the importance of learning, knowledge, change".

ISSUE 3: THE CRITICAL IMPACT OF ERP SUCCESS OR FAILURE
No. of comments = 21 of total 163 12.88%

(21 comments) ***Critical Impact***	The ERP project is cross-organisational and actually serves as the platform to integrate three independent companies into one global entity, and in this process they had to generate the main central IT system from scratch. Thus, **failure to develop and implement the ERP project successfully could have had disastrous results**."

ISSUE 4: ORGANISATION - VENDOR RELATIONSHIP
No. of comments = 17 of total 163 10.43%

12 comments) ***Contract***	"Issues such as a 'transfer addendum'– can turn an external expert from outsourcing personnel into an internal employee - It is an accepted practice, very unpopular with the outsourcing companies and I usually have to 'bend their arms'"
(5 comments) ***Absorption of knowledge***	We added to each vendor's implementer one or two of ours whom we called 'shadows' – an internal IT worker as an escort who joined the external implementer, so that we could actually absorb the implementation of the SAP from those experts in each of the modules".

ISSUE 5: PROBLEMS IN USING OUTSOURCING IN AN ERP PROJECT
No. of comments = 8 of total 163 4.91%

(5 comments) ***Higher costs*****:**	The traditional cost-saving reason for outsourcing is exactly the opposite when talking about ERP projects - outsourcing increases direct costs – and this is one of the reasons that organisations should try to reduce outsourcing when they can". "When meeting other information systems managers – I can tell you that we continuously look at costs. And because of the exclusivity of this bubble, of the market of SAP applications with all their various modules, the wages are very high, the differences in costs between maintaining an internal employee and bringing him in from outside, are very significant".
(3 comments) ***Preserving knowledge***	"Because of the need to keep people with the necessary organisational knowledge, having an external work force for the long run seems to be problematic."

Appendix 9.4: Indicators used in Closed-ended Questionnaire

Table 1: Notation of the reasons and benefits indicators used in part 1 of the close-ended questionnaire

Item No,	Reasons and Benefits Indicators
a01	To enable the organisation to focus on / OR allocate resources to core business issues
a02	To access best-practice capabilities to develop strategic systems
a03	So that the organisation can be exposed to new strategies, disciplines or services
a04	Swifter response to achieve organisational and strategic objectives
a05	To reduce ERP project development costs
a06	Reduce time – expert outsider can complete the job faster than in-house team
a07	Flexible budgeting of the project
a08	Share or reduce risks by sharing with external entity
a09	Rationalise expenses: Transforming a capital investment (in-house staff wages) into operational expenses for external staff
a10	Avoid increase in in-house work force
a11	To employ experienced professional manpower to manage the ERP project
a12	To get a commitment to timetable, products and a pre-defined and closed budget.
a13	Improve efficiency and performances with a flexible development process
a14	Accumulate knowledge and experience for the in-house staff concerning the development and operation of the new system
a15	Introduce external viewpoints and disciplines into the organisation
a16	Ability to impose penalties for non-performance / non-compliance with goals
a17	To enable optimal utilisation of in-house staff
a18	To access and implement new technology
a19	Acquire expertise not available in-house
a20	Increased probability to construct stable information system
a21	Correct implementation with minimum customisation and deviations from standard
a22	To get to know the common defects and previous experience of how to solve them
a23	To cope with deficiencies of in-house staff
a24	To maintain more stable in-house staffing levels
a25	To reduce number of direct employees
a26	Add more personnel to fill a need for short-term, part-time or temporary efforts
a27	Overcoming the difficulty in recruiting and maintaining IT professionals
a28	Be more market competitive
a29	To maintaining and update organisational knowledge assets
a30	Improve customer service (both intra- and extra-organisation)
a31	Facilitate and simplify performance of changes in the organisation

Table 2: Notation of the success factors indicators used in part 2 of the close-ended questionnaire

Ideal importance Item No.	Importance expressed in practice Item No.	Success Factors' Indicators
b01	c01	Commitment, involvement and endorsement by the organisation's management for the project, and successful integration of outsourcing factors
b02	c02	Definition of goals and methodical planning of the project.
b03	c03	Choice of vendor with strong managerial and professional experience and ability, and experience in the introduction of change in an organisation
b04	c04	Examination of the vendor's ability to comply with professional and managerial commitments.
b05	c05	Ensuring a high level of consultants in important positions (management, architecture, and implementation).
b06	c06	Preference for a vendor with prior knowledge of the customer's systems
b07	c07	Agreement with the vendor concerning contents at the specification stage
b08	c08	Definition of detailed work plan for the vendor
b09	c09	Pre-determination of logical timetable for project performance
b10	c10	Lucid contract clearly defining vendor-client obligations
b11	c11	Vendor's undertaking for stable staff during project
b12	c12	Alterations of contents and work conditions coordinated with vendor
b13	c13	Creation of common vendor-client approach (WIN-WIN)
b14	c14	Construction of mechanism for supervision and control of progress
b15	c15	Tight cooperation between vendor and client
b16	c16	Vendor undertakes to conduct training of replacements, guidance and instruction
b17	c17	Close escorting of the organisation juniors by external consultants
b18	c18	Vendor works according to systematic methodology of project management
b19	c19	Construction of set-up with decision-making mechanisms
b20	c20	Effective management of 'surprises' and unanticipated incidents
b21	c21	Flexibility in handling of consultants and the external companies for better control and supervision
b22	c22	Adding external independent consultants to ERP project manager

Ideal importance Item No.	Importance expressed in practice Item No.	Success Factors' Indicators
b23	c23	Vendor's stipulation to ensure fair and proper work conditions for his employees
b24	c24	Correct calculation of hidden costs in advance
b25	c25	Providing the vendor's employees with an empowered sense of identification and commitment to the success of the project
b26	c26	Assimilation of the vendor within the organisation's culture
b27	c27	Overcoming resistance within the organisation before the project begins
b28	c28	Professional treatment of the technical infrastructure and materials
b29	c29	Treatment of information security within the organisation
b30	c30	Learning from the vendor's sophisticated management and technological tools
b31	c31	Constructing a combined balanced team from the external and internal manpower
b32	c32	Reducing the extent of dependence on the external vendor
b33	c33	Taking care to maintain the knowledge within the organisation

Appendix 9.5: Correlations for Reasons for Employment of IT Outsourcing

Table 1: Detailed Pearson correlation coefficients for reasons for employment of IT Outsourcing

N	Sig.	a04	N	Sig.	a03	N	Sig.	a02	N	Sig.	a01	
									72	0.0045	0.33112	a02
						71	<.0001	0.58387	71	0.0002	0.42413	a03
			71	0.009	0.31009	72	0.0634	0.21991	72	0.0002	0.42805	a04
71	<.0001	0.52936	70	0.081	0.21031	71	0.221	0.14706	71	0.0001	0.43664	a05
72	<.0001	0.64081	71	0.17	0.16463	72	0.1729	0.16242	72	0.0028	0.34681	a06
72	0.0002	0.42367	71	0.851	0.02265	72	0.4568	-0.08907	72	0.0002	0.4228	a07
72	0.1769	0.16093	71	0.796	0.03125	72	0.2243	-0.14499	72	0.0432	0.23899	a08
72	0.3971	0.10131	71	0.17	0.16473	72	0.3391	-0.11429	72	0.1341	0.17827	a09
72	0.9604	0.00595	71	0.267	0.13354	72	0.7742	-0.0344	72	0.1981	0.15346	a10
72	0.0008	0.38734	71	0.023	0.26891	72	0.0931	0.19939	72	0.0016	0.3654	a11
72	0.005	0.32731	71	0.09	0.20256	72	0.1794	0.16002	72	0.0009	0.38191	a12
72	<.0001	0.56129	71	0.029	0.25885	72	0.1849	0.15804	72	0.0008	0.38531	a13
72	0.0108	0.29857	71	0.031	0.25662	72	0.2777	0.12967	72	0.012	0.29465	a14
72	0.5827	-0.06584	71	0.308	0.1227	72	0.4785	0.08486	72	0.468	0.08689	a15
72	0.1142	-0.1878	71	0.262	-0.135	72	0.0121	-0.29439	72	0.7693	0.03516	a16
72	0.7705	0.03499	71	0.374	-0.10719	72	0.2169	-0.14729	72	0.1512	0.17089	a17
72	0.4223	0.09602	71	0.035	0.25065	72	0.0232	0.26732	72	0.007	0.31502	a18
72	0.0514	0.23048	71	0.048	0.23579	72	0.0312	0.25416	72	0.001	0.3805	a19
72	<.0001	0.46486	71	0.076	0.21221	72	0.3213	0.11854	72	0.2699	0.13177	a20
72	0.0089	0.30606	71	0.017	0.28274	72	0.0342	0.25	72	0.0253	0.26348	a21
72	0.4679	0.0869	71	0.04	0.24501	72	0.101	0.19482	72	0.6301	0.05772	a22
72	0.2701	0.13171	71	0.597	0.06381	72	0.4551	-0.08942	72	0.5023	0.08034	a23
72	0.1085	0.19076	71	0.109	0.19212	72	0.8727	-0.01922	72	0.1144	0.18768	a24
72	0.3959	0.10158	71	0.115	0.189	72	0.163	-0.16618	72	0.0506	0.2313	a25
72	0.8898	0.01662	71	0.813	-0.02856	72	0.5964	-0.06346	72	0.5535	-0.07098	a26
72	0.0027	0.34804	71	0.305	0.12341	72	0.5515	-0.07135	72	0.0036	0.33871	a27
71	0.0002	0.43341	70	0.954	0.00709	71	0.3463	0.11342	71	<.0001	0.51782	a28
71	0.0015	0.37013	70	0.866	-0.02062	71	0.3496	0.11266	71	0.042	0.24205	a29
71	0.0007	0.39466	70	0.728	-0.04229	71	0.9013	-0.01499	71	0.0072	0.3161	a30
72	<.0001	0.50742	71	0.18	0.16091	72	0.3575	0.11003	72	<.0001	0.49122	a31

N	Sig.	a08			a07	N	Sig.	a06	N	Sig.	a05	
									71	<.0001	0.57334	a06
						72	<.0001	0.4465	71	<.0001	0.45082	a07
			72	<.0001	0.53481	72	0.2819	0.12853	71	0.3264	0.11816	a08
72	<.0001	0.48397	72	0.0012	0.37498	72	0.5899	0.06458	71	0.607	0.06208	a09
72	0.0118	0.2954	72	0.0562	0.2261	72	0.8622	-0.02082	71	0.4846	-0.0843	a10
72	0.3774	0.10558	72	0.0289	0.25767	72	0.0002	0.42094	71	0.002	0.36046	a11
72	0.0022	0.35576	72	0.0093	0.30438	72	<.0001	0.47571	71	0.0002	0.43376	a12
72	0.3824	0.10449	72	0.0366	0.24682	72	<.0001	0.56906	71	<.0001	0.49204	a13
72	0.5744	0.06729	72	0.3994	0.10083	72	0.0063	0.31903	71	0.0001	0.44249	a14
72	0.0011	0.37749	72	0.2979	0.12437	72	0.8614	-0.02094	71	0.6065	0.06218	a15
72	<.0001	0.50449	72	0.0363	0.24715	72	0.2171	-0.14725	71	0.9198	-0.01216	a16
72	0.023	0.26763	72	0.0016	0.36556	72	0.5398	0.07345	71	0.0831	0.20709	a17
72	1	0	72	0.1794	0.16001	72	0.5884	0.06484	71	0.2294	0.14445	a18
72	0.079	0.20839	72	0.0253	0.26352	72	0.0621	0.22102	71	0.6514	0.05454	a19
72	0.2095	0.14968	72	0.0025	0.3517	72	0.0016	0.36609	71	0.003	0.34784	a20
72	0.1466	0.17281	72	0.0447	0.23731	72	0.0049	0.32781	71	0.0001	0.44165	a21
72	0.1874	0.15715	72	0.0764	0.21018	72	0.0051	0.32659	71	0.0032	0.34532	a22
72	0.0649	0.21874	72	0.1402	0.17553	72	0.3062	0.12227	71	0.8669	0.02025	a23
72	0.0305	0.2552	72	0.0371	0.24618	72	0.856	0.02176	71	0.7116	0.04464	a24
72	0.0126	0.29276	72	0.0228	0.26801	72	0.4093	0.09872	71	0.1942	0.1559	a25
72	0.8879	0.01691	72	0.4095	0.09869	72	0.7464	0.03878	71	0.2997	0.1248	a26
72	0.5387	0.07365	72	0.0217	0.27017	72	0.0045	0.33113	71	0.0127	0.29441	a27
71	0.0118	0.29736	71	<.0001	0.47388	71	0.0002	0.42851	71	<.0001	0.50377	a28
71	0.7073	0.04534	71	0.0298	0.25801	71	0.001	0.38103	70	<.0001	0.50617	a29
71	0.1777	0.16178	71	0.0059	0.32382	71	0.0003	0.42084	70	<.0001	0.56006	a30
72	0.029	0.25754	72	0.0007	0.39029	72	<.0001	0.51023	71	<.0001	0.62039	a31

N	Sig.	a12	N	Sig.	a11	N	Sig.	a10	N	Sig.	a09	
									72	<.0001	0.51154	a10
						72	0.6511	0.0542	72	0.146	0.17307	a11
			72	0.0012	0.37401	72	0.0456	0.23635	72	0.1468	0.17273	a12
72	<.0001	0.51759	72	0.0024	0.35226	72	0.8323	-0.02539	72	0.3414	0.11375	a13
72	0.0127	0.29222	72	0.0144	0.28743	72	0.1639	-0.16581	72	0.2005	-0.15266	a14
72	0.3109	0.1211	72	0.0764	0.21019	72	0.0071	0.31484	72	<.0001	0.45113	a15
72	0.1314	0.17949	72	0.2299	-0.14327	72	0.3484	0.11212	72	0.001	0.3784	a16
72	0.1915	0.15573	72	0.2604	0.13438	72	<.0001	0.45524	72	0.0105	0.29975	a17
72	0.2898	0.12646	72	0.001	0.37989	72	0.1646	0.16556	72	0.0355	0.2483	a18
72	0.2258	0.14452	72	0.0003	0.41311	72	0.374	0.10634	72	0.08	0.20767	a19
72	0.1274	0.18136	72	0.1212	0.18429	72	0.8126	0.02844	72	0.593	0.06404	a20
72	0.0039	0.33587	72	0.0118	0.29542	72	0.874	0.01902	72	0.2327	-0.14242	a21
72	0.0161	0.28274	72	0.0016	0.36557	72	0.3142	0.12029	72	0.6725	0.05067	a22
72	0.3568	0.1102	72	0.2027	0.15192	72	0.0002	0.42789	72	0.0011	0.3757	a23
72	0.2633	0.13357	72	0.0062	0.31969	72	<.0001	0.53096	72	0.0025	0.35112	a24
72	0.4515	0.09013	72	0.8769	-0.01858	72	<.0001	0.4843	72	<.0001	0.62991	a25
72	0.4159	0.09736	72	0.054	0.22804	72	0.1765	0.16108	72	0.0182	0.27756	a26
72	0.0177	0.27891	72	0.0451	0.23694	72	0.3661	0.10809	72	0.2297	0.14333	a27
71	0.0011	0.37972	71	0.0041	0.33667	71	0.9439	0.0085	71	0.8703	0.01973	a28
71	0.0023	0.35661	71	0.4948	0.08235	71	0.1631	-0.16731	71	0.0295	-0.25857	a29
71	0.013	0.29341	71	0.0349	0.25075	71	0.2187	-0.14779	71	0.1772	-0.16197	a30
72	<.0001	0.48836	72	0.0005	0.3993	72	0.9839	0.00242	72	0.8077	0.02919	a31

N	Sig.	a16	N	Sig.	a15	N	Sig.	a14	N	Sig.	a13	
									72	<.0001	0.54159	a14
						72	0.1293	0.18046	72	0.254	0.1362	a15
			72	0.0285	0.25831	72	0.632	-0.0574	72	0.7843	-0.03282	a16
72	0.4345	0.09354	72	0.0025	0.35072	72	0.295	0.12513	72	0.3778	0.10549	a17
72	0.7393	-0.03989	72	0.0024	0.3518	72	0.3336	0.11559	72	0.2527	0.13656	a18
72	0.6367	-0.05661	72	0.0002	0.42784	72	0.0381	0.24494	72	0.0175	0.27922	a19
72	0.3994	-0.10083	72	0.9117	-0.0133	72	0.0291	0.25729	72	<.0001	0.48718	a20
72	0.5136	0.07823	72	0.4676	0.08696	72	0.0001	0.43378	72	0.0026	0.34999	a21
72	0.8322	0.02541	72	0.0369	0.24646	72	0.0002	0.42162	72	0.0582	0.2243	a22
72	0.7145	0.04385	72	0.0106	0.29939	72	0.1893	0.1565	72	0.2359	0.14145	a23
72	0.9927	-0.00109	72	0.0002	0.4258	72	0.7327	0.04096	72	0.0433	0.23886	a24
72	0.2965	0.12474	72	0.0072	0.31427	72	1	0	72	0.226	0.14446	a25
72	0.7152	0.04375	72	0.0004	0.40505	72	0.1097	0.19012	72	0.0727	0.21279	a26
72	0.9043	-0.01442	72	0.3352	0.1152	72	0.0018	0.36238	72	0.0002	0.43026	a27
71	0.6374	0.0569	71	0.0744	0.2131	71	<.0001	0.46203	71	<.0001	0.50682	a28
71	0.4524	0.09061	71	0.3899	-0.10361	71	0.0066	0.31947	71	<.0001	0.47802	a29
71	0.6254	0.05894	71	0.7271	0.04214	71	0.0312	0.25595	71	<.0001	0.48501	a30
72	0.76	-0.03662	72	0.6846	-0.04869	72	0.0014	0.37011	72	<.0001	0.46701	a31

N	Sig.	a20	N	Sig.	a19	N	Sig.	a18	N	Sig.	a17	
									72	0.0211	0.27144	a18
						72	<.0001	0.49837	72	0.1839	0.15839	a19
			72	0.0718	0.21344	72	0.1249	0.18252	72	0.2769	0.12986	a20
72	0.0004	0.40466	72	0.0906	0.20091	72	0.0102	0.30103	72	0.2263	0.14436	a21
72	0.0155	0.28435	72	0.1191	0.18533	72	0.0998	0.19548	72	0.1729	0.1624	a22
72	0.1353	0.17774	72	0.0007	0.38962	72	0.403	0.10006	72	0.0831	0.20563	a23
72	0.0023	0.35369	72	0.002	0.35817	72	<.0001	0.45091	72	0.0004	0.40836	a24
72	0.0811	0.20695	72	0.1882	0.15687	72	0.0395	0.24323	72	0.0004	0.40415	a25
72	0.8173	0.02771	72	0.0113	0.29708	72	0.0038	0.33656	72	0.1985	0.15333	a26
72	0.0285	0.25833	72	0.0126	0.29265	72	0.0087	0.30699	72	0.0128	0.29208	a27
71	0.0022	0.35735	71	0.0042	0.33566	71	0.0186	0.2787	71	0.33	0.11729	a28
71	<.0001	0.46402	71	0.8728	-0.01934	71	0.372	0.10755	71	0.9266	-0.01113	a29
71	<.0001	0.54379	71	0.2628	0.13468	71	0.1132	0.18963	71	0.252	0.13775	a30
72	0.0004	0.40591	72	0.2875	0.12707	72	0.173	0.16237	72	0.1673	0.1645	a31

N	Sig.	a24	N	Sig.	a23	N	Sig.	a22	N	Sig.	a21	
									72	<.0001	0.63128	a22
						72	0.033	0.25155	72	0.378	0.10544	a23
			72	<.0001	0.51208	72	0.1172	0.18628	72	0.0094	0.30425	a24
72	<.0001	0.44907	72	<.0001	0.45869	72	0.1559	0.16899	72	0.6815	-0.04919	a25
72	0.1294	0.1804	72	0.0797	0.20789	72	0.035	0.24892	72	0.6382	0.05636	a26
72	0.018	0.2781	72	0.0507	0.23119	72	0.1068	0.19165	72	0.0513	0.23066	a27
71	0.0388	0.24576	71	0.2209	0.14709	71	0.1603	0.16843	71	<.0001	0.45025	a28
71	0.7145	0.04417	71	0.1963	-0.15516	71	0.426	0.09596	71	0.0002	0.42999	a29
71	0.2751	0.13129	71	0.368	-0.10845	71	0.2805	0.12983	71	0.0007	0.39313	a30
72	0.1386	0.17625	72	0.5052	0.07981	72	0.0255	0.26312	72	<.0001	0.4476	a31

N	Sig.	a28	N	Sig.	a27	N	Sig.	a26	N	Sig.	a25	
									72	0.0132	0.29096	a26
						72	0.0081	0.30997	72	0.0029	0.3462	a27
			71	0.0006	0.39901	71	0.0459	0.23771	71	0.902	0.01487	a28
70	<.0001	0.69365	71	0.0086	0.30975	71	0.6157	0.0606	71	0.1363	-0.17855	a29
70	<.0001	0.64566	71	0.0277	0.26136	71	0.2103	0.15051	71	0.8665	0.02031	a30
71	<.0001	0.59609	72	0.0103	0.30056	72	0.3966	-0.10142	72	1	0	a31

N	Sig.	a30	N	Sig.	a29	
			71	<.0001	0.73236	a30
71	<.0001	0.55079	71	<.0001	0.56853	a31

Appendix 9.6:

Table 1: Comparison of closed-ended questionnaire findings (Part 1) with findings of Seddon et al. (2002)/ Testing Domberger 's theory concerning IT Outsourcing

Spearman Correlation Coefficients, 0.64825 Sig. 0.0049 , N = 17

No.	The complete Reasons / Benefits list as was referred in Seddon et al. (2002) research	The equivalent indicators used in current study	Seddon et al. (2002) findings	Current study (IT outsourcing in ERP projects)
1	Access to better or more skills/expertise	a11	0.91	0.86
2	Unable to provide services internally	a19	0.72	0.88
3	Concentration on core business	a01	0.76	0.77
4	Better match of resource supply to demand	a13	0.71	0.78
5	Access to better or more technology	a18	0.78	0.83
6	Better use of in-house personnel	a17	0.73	0.66
7	Obtain better service	a04	0.69	0.73
8	Improve flexibility for the business	a28	0.65	0.70
9	Reduce cost	a05	0.58	0.70
10	Compliance with outsourcing mandate		0.44	
11	Allow more flexible work practices	a07	0.51	0.67
12	Enhance management control	a12	0.51	0.80
13	Rationalise assets	a29	0.38	0.68
14	Change users' accountability		0.51	
15	Reduce staff numbers	a10	0.46	0.69
16	Shift from capital to operating expense	a09	0.38	0.60
17	Industry or economic development	a28	0.28	0.70
18	Dissatisfaction with internal providers		0.27	
19	Temporary solution	a26	0.15	0.70
20	Get penalties for non-performance	a16	0.14	0.53
21	Improve cash flow		0.11	